Pentium® M Processor, Intel® 855GME Chipset and Intel® FW82801DB (ICH4) Development Kit

User's Manual

July 2005

Order Number: 273919-003

Contents

Figures

Tables

Revision History

Date	Revision	Description
October 2003	001	Initial public release of this document.
November 2003	002	Updated some product feature information and document references.
July 2005	003	Corrected document errors. Added missing tables and updated figures.

About This Manual 1

This manual describes how to set up and use the board and other components included in your Pentium® M processor, Intel® 855GME Chipset and Intel® FW82801DB Development Kit.

1.1 Content Overview

Chapter 1, “About This Manual” – This chapter contains a description of conventions used in this manual and instructions for obtaining literature and contacting customer support.

Chapter 2, “Getting Started” – Provides complete instructions on how to configure the board and processor assembly by setting jumpers, connecting peripherals, providing power, and configuring the BIOS.

Chapter 3, “Theory of Operation” – This chapter provides information on the system design.

Chapter 4, “Hardware Reference” – This chapter provides a description of jumper settings and functions, and pinout information for each connector.

Chapter 5, “BIOS Overview”– This chapter provides information on BIOS setup and configuration.

Appendix A, “Bill of Materials” – This appendix contains the bill of materials for the board.

Appendix B, “Schematics” - This appendix contains the schematics for the board.

1.2 Text Conventions

The following notations may be used throughout this manual.

#	The pound symbol (#) appended to a signal name indicates that the signal is active low.
Variables	Variables are shown in *italics*. Variables must be replaced with correct values.
Instructions	Instruction mnemonics are shown in uppercase. When you are programming, instructions are not case-sensitive. You may use either upper- or lowercase.
Numbers	Hexadecimal numbers are represented by a string of hexadecimal digits followed by the character H. A zero prefix is added to numbers that begin with A through F. For example, FF is shown as 0FFH. Decimal and binary numbers are represented by their customary notations. That is, 255 is a decimal number and 1111 1111 is a binary number. In some cases, the letter B is added for clarity.
Signal Names	Signal names are shown in uppercase. When several signals share a common name, an individual signal is represented by the signal name followed by a number, while the group is represented by the signal name followed by a variable (n). For example, the lower chip-select signals are named CS0#, CS1#, CS2#, and so on; they are collectively called CSn#. A pound symbol (#) appended to a signal name identifies an active-low signal. Port pins are represented by the port abbreviation, a period, and the pin number (e.g., P1.0).
Units of Measure	The following abbreviations are used to represent units of measure:

A	amps, amperes
Gbyte	gigabytes
GHz	gigahertz
Kbyte	kilobytes
KΩ	kilo-ohms
mA	milliamps, milliamperes
MByte	megabytes
MHz	megahertz
ms	milliseconds
mW	milliwatts
ns	nanoseconds
pF	picofarads
W	watts
V	volts
µA	microamps, microamperes
µF	microfarads
µs	microseconds
µW	microwatts

1.3 Technical Support

1.3.1 Electronic Support Systems

Intel's site on the World Wide Web (http://www.intel.com/) provides up-to-date technical information and product support. This information is available 24 hours per day, 7 days per week, providing technical information whenever you need it.

1.3.1.1 Online Documents

Product documentation is provided online in a variety of web-friendly formats at:

http://developer.intel.com/design/intarch/devkits/index.htm

1.3.2 Additional Technical Support

If you require additional technical support, please contact your field sales representative or local distributor.

1.4 Product Literature

You can order product literature from the following Intel literature centers.

1-800-548-4725	U.S. and Canada
708-296-9333	U.S. (from overseas)
44(0)1793-431155	Europe (U.K.)
44(0)1793-421333	Germany
44(0)1793-421777	France
81(0)120-47-88-32	Japan (fax only)

1.5 Related Documents

For more information, contact your local Intel representative.

Table 1. Related Documents

Document	Intel Order Number	Location
Intel® Pentium® M Processor Datasheet	252612	http://developer.intel.com
Intel® Pentium® M Processor on 90nm Process with 2-MB L2 Cache Datasheet	302189	http://developer.intel.com
Intel® Pentium® M Processor and Intel® 855GME Chipset Platform Design Guide	273903	http://developer.intel.com
Intel® 855GM/855GME Chipset Graphics and Memory Controller Hub (GMCH) Datasheet	252615	http://developer.intel.com
Intel® 855GM/855GME Chipset Graphics and Memory Controller Hub (GMCH) Spec Update	253572	http://developer.intel.com
Intel® 82801DB I/O Controller Hub 4 (ICH4) Datasheet	290744	http://developer.intel.com
Intel® 82801DB I/O Controller Hub 4 (ICH4) Spec Update	290745	http://developer.intel.com
Intel® 855GME and Intel® 852GME Chipset Memory Controller Hub (MCH) Thermal Design Guide for Embedded Applications	273838	http://developer.intel.com
Intel® 82801DB I/O Controller Hub 4 (ICH4): Thermal and Mechanical Design Guide	298651	http://developer.intel.com
ITP700 Debug Port Design Guide	249679	http://developer.intel.com

Getting Started 2

This chapter identifies the Pentium® M Processor, Intel® 855GME Chipset and Intel® FW82801DB Development Kit's key components, features and specifications. It also describes how to set up the board for operation.

2.1 Overview

The development kit contains a baseboard with a Pentium M processor with 1 MByte L2 cache, Intel 855GME chipset, and other system board components and peripheral connectors. Various software and documentation are also included in the kit.

Note: The board is shipped as an open system, allowing for maximum flexibility in changing hardware configuration and peripherals in a lab environment. Since the board is not in a protective chassis, the user is required to observe extra precaution when handling and operating the system. Some assembly is required before use.

2.2 Board Features

The board features are summarized below:

CPU

- On-die, primary 32-kB instruction cache and 32-kB write-back data cache
- On-die, 1-MB second level cache with Advanced Transfer Cache Architecture
- Supports 32-bit AGTL+ bus addressing (no support for 36-bit address extension).
- Advanced Power Management features including Enhanced Intel SpeedStep® technology
- Supports Uni-processor (UP) systems.
- 400 MT/s Pentium M processor FSB support (100 MHz)
- 2x Address, 4x Data

Intel 855GME Chipset

- Support for Intel Pentium M processor and Intel® Celeron® M processor
- Support for 333-MHz DDR SDRAM devices with max of two double-sided DIMMs (four rows populated) with unbuffered PC2700 DDR SDRAM.
- Supports 128-Mbit, 256-Mbit, and 512-Mbit memory technologies
- Dedicated LFP (local flat panel) interface
- Multiple internal graphics options - DVOB/DVOC, LVDS, and VGA
- AGP 4x support
- Supports data format up to 18-bpp

- Core Vcc = 1.2 V or 1.35 V (1.35 V needed to support Graphics core frequency of 250 MHz and 333-MHz DDR SDRAM devices)

Flash System BIOS ROM

- AMI* system BIOS

System I/O

- Three PCI slots
- Six USB 2.0 ports (four in the back and two in the front)
- One floppy connector
- Two Ultra ATA-100/66/33 IDE connector supporting up to four IDE devices
- One built-in 16550 fast UART compatible serial port connector
- Built-in Standard/EPP/ECP parallel port connector
- Built-in PS/2 keyboard and PS/2 mouse (six-pin mini-DIN) connectors
- Line IN, Line Out and MIC IN connectors

2.3 Included Hardware

The following hardware is included in the development kit:

- Board (baseboard) with battery
- BIOS Image from American Megatrends* (FWH installed on board)
- One Pentium M processor with 1 MBytes L2 cache at 1.6 GHz with 400 MHz FSB (installed on board)
- One fansink thermal solution and metal attachment bracket
- One MCH heatsink and attachment clip
- One 128 MBytes DDR DIMM
- One IDE hard drive and 80-pin IDE cable (cable will support two IDE devices)

2.4 Software Key Features

Note: Software in the kit is provided free by the vendor and is only licensed for evaluation purposes. Refer to the documentation in your development kit for further details on any terms and conditions that may be applicable to the granted licenses. Customers using tools that work with other third party products must have licensed those products. Any targets created by those tools should also have appropriate licenses. Software included in the kit is subject to change.

Refer to http://developer.intel.com/design/intarch/devkits for details on additional software from other third party vendors.

2.4.1 AMIBIOS*

The board is pre-installed and licensed with a copy of AMIBIOS8* from American Megatrends*.

2.5 Before You Begin

Table 2 presents the additional hardware you may need for your development kit.

Table 2. Additional Hardware

Component	Description
VGA Monitor	You can use any standard VGA or greater resolution monitor.
Keyboard	You can use a keyboard with a PS/2 style connector/adapter or one with a USB connector.
Mouse	You can use a mouse with a PS/2 style connector or adapter as well as USB or serial style connector.
IDE Devices	You can connect up to four IDE devices to the board. One IDE hard drive and cable are included in your kit. The cable accommodates the included hard drive and one other IDE device, such as a CD-ROM drive or another hard drive.
Floppy Drive	You can connect up to two floppy drives to the connector on the board. No floppy drives or cables are included in the development kit.
Video Adapter	You can use the on-board video adapter supplied with your kit, or you may install your own AGP video card. You must procure and install the correct drivers for any additional video adapters.
Network Adapter	An Intel® 83562ET Ethernet Controller is included in the development kit. A CAT-5 cable with an RJ45 connector is required to connect this Ethernet adapter to your network. You may use a different network card other than the controller included on the board, however, you are responsible for installing the correct drivers for any additional network cards.
Other Devices and Adapters	The board behaves much like a standard PC motherboard. Many PC-compatible peripherals can be attached and configured to work with the board. For example, you may want to install a sound card or additional network adapters. You are responsible for procuring and installing any drivers required for additional devices.
ATX Power Supply	You must use an ATX 12 V power supply with a minimum of 300 W support.

2.6 Setting up the Board

Once you have gathered the hardware described in the last section, follow the steps below to set up your development kit. This manual assumes you are familiar with basic concepts involved with installing and configuring hardware for a PC or server system.

1. **Ensure a safe work environment.** Make sure you are in a static-free environment before removing any components from their anti-static packaging. The board is susceptible to electrostatic discharge, which may cause product failure or unpredictable operation.

Caution: Connecting the wrong cable or reversing a cable may damage the board and may damage the device being connected. Since the board is not in a protective chassis, use caution when connecting cables to this product.

2. **Verify kit contents.** Inspect the contents of your kit, and ensure that everything listed in Section 2.3 is included. Check for damage that may have occurred during shipment. Contact your Intel sales representative if any items are missing or damaged.
3. **Gather tools.** You will need a Phillips-head screwdriver and a 6/32-inch hex wrench for installation.
4. **Check jumper settings.** Verify that the following jumpers are set in their default state. Refer to Table 3 for detailed descriptions of all jumpers and their default settings indicated in bold.

Table 3. Jumper Settings

Jumper	Function	Default Setting	Optional Setting
J4E1	Clock Config: Bit_2	Open	Short reserved
J4E2	Clock Config: Bit_1	Open	Short reserved
J4E3	Clock Config: Bit_0	Open	Short reserved
J4E4	DVO Select (If DVODTECT = 0 during Reset, ADDID[7:0] is latched to the ADDID register)	Open	Short for AGP 4X
J4E5	VTT Voltage Select	Open	Short reserved
J1J1	CMOS Clear	1-2 Normal	2-3 Clear CMOS
J1G4	Recover/Configure	1-2 Normal	2-3 Configure, Open Recovery
J2H3	Disable No_Reboot Option	Open	Short - No reboot
J2H2	Disable Speaker	1-2 Normal	2-3 Disable

5. **Verify installed hardware.** Make sure the following hardware is populated on your board:
   - — One Pentium M processor in socket U8D1
   - — BIOS FWH in socket U1H1
   - — Battery in battery holder BT1F1

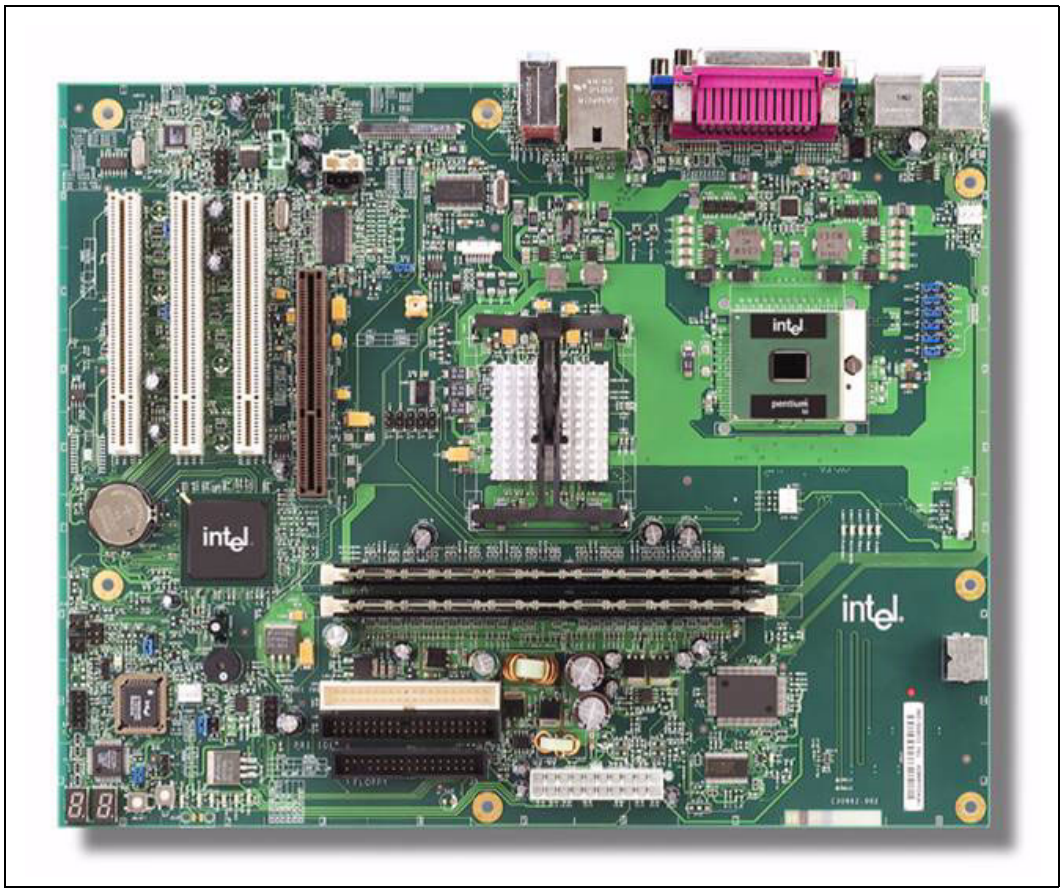
   Note: The above hardware should have been correctly installed at the factory. If they are not installed correctly, DO NOT power on the board. Correctly re-install the components before proceeding. If you suspect that any of the kit components have been damaged, contact your Intel field sales representative or local distributor for assistance.

6. **Install fansinks.** You must install a fansink on the processor. Place the white gasket on the heat sink retention mechanism. From the back of the board feed the heat sink retention mechanism lugs up through the board. Apply an even amount of thermal grease on the die of the Pentium M processor. Place the fansink on top of the processor, fitting it onto the retention mechanism lugs. Slide the fansink to lock it onto the retention mechanism lugs. Rotate the heatsink clockwise to apply slight pressure onto the die. Connect the three-pin fansink power connector to connector J8E1 on the board.

Caution: Applying excess pressure may cause the die to crack.

7. **Install memory.** Your kit includes one 128 MByte DIMM. Install the DIMM in memory slot J3G1 or J3G2. To install, ensure the tabs on the slot are open, or rotated outward from the slot. Line up the DIMM above the slot (the DIMM is keyed so that it only fits in the slot in one orientation). Firmly, but carefully, insert the DIMM into the slot until the tabs close.

Figure 1. Assembled Board, Top View



8. **Install storage devices.** There are two IDE connectors on the board, which supports four IDE devices—two master and two slave. The kit includes one IDE hard drive.

   For a correct boot-up of the system, ensure that the included hard drive is installed as the primary master.

   Note: Master/slave settings are determined by a jumper on each IDE device. Consult the device label/documentation to verify that the jumper is set correctly for the configuration you choose.

   A CD-ROM drive or additional hard drive may be installed as a primary slave device.

   To install the included hard drive on the board:

   a. Verify that the jumper on the hard drive is set correct for single or master, depending on your configuration.

   b. Connect the short end of the IDE cable to the IDE connector J3H3 on the board. Ensure that the tracer on the cable is aligned with pin 1 of the connector.

   c. Connect the middle connector of the cable to the hard drive. Again, ensure that the cable tracer is aligned with pin 1 of the connector.

   Note: Failure to properly align the IDE cable may damage the board and/or the hard drive.

   d. Connect a large four-pin power connector from the power supply to the hard drive.

e. Install the CD-ROM drive (optional). A CD-ROM drive is not included in the kit and is not required, but you may find it useful in loading additional software. You must furnish your own CD-ROM drive. To install it on the board:

— Verify that the jumper on the CD-ROM drive is set for slave.

— Connect the unused end of the IDE cable you already attached to the board to the CD-ROM drive. Ensure that the cable tracer is aligned with pin 1 of the CD-ROM drive connector.

— Connect a large four-pin power connector from the power supply to the CD-ROM drive.

f. Install the floppy drive (optional). A floppy disk drive is not included in your kit and is not required, but you may find it useful in loading additional software. You must furnish your own floppy drive(s) and cable. To install a floppy drive on the board:

— Connect the floppy cable to the floppy connector J3J1. Ensure that the tracer on the cable is aligned with pin 1 of the connector.

— Connect the other end of the floppy cable to the floppy drive.

— Connect a power cable to the floppy drive. Ensure that the tracer on the cable is aligned with pin 1 of the connector.

9. **Connect the monitor.** Connect the monitor cable to the VGA port.
10. **Connect the keyboard and mouse.** Connect a PS/2 mouse and keyboard to the stacked PS/2 connector on the board. The top connector is for the mouse, and the bottom is for the keyboard. Alternatively, you may plug a USB keyboard and a USB mouse into one or both of the USB connectors on the board. Note that a legacy (PS/2) keyboard may be required for BIOS setup.
11. **Connect the power supply.** Make sure the power supply is turned off and unplugged. Connect the ATX power supply cables to connector J6J5 on the board. Next, plug the power cord into the power supply and the wall.
12. **Power up the system.** Turn on the monitor, then turn on the board. The on-board power on/off button is located at J1J2. The on-board reset button is located at J1J3.

Caution: Ensure that the fansink on the processor is operating. If not, turn off the power immediately and verify that the fansink is connected to the board correctly (see Step 6). If the fansink is not operating, contact your Intel field sales representative or local distributor.

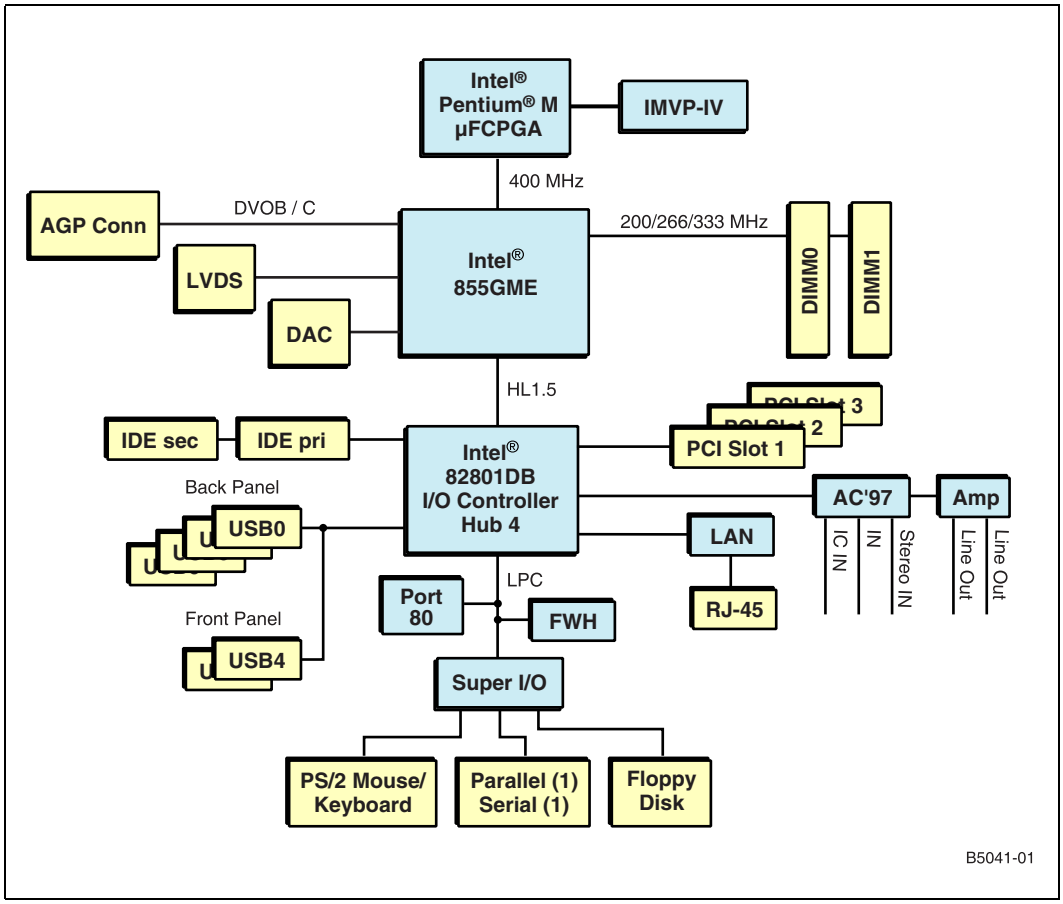
2.7 Configuring the BIOS

An AMIBIOS* is pre-loaded on the board. You may need to make changes to the BIOS to enable hard disks, floppy disks and other supported features. You may use the Setup program to modify BIOS settings and control the special features of the system. Setup options are configured through a menu-driven user interface. On first boot-up of the system, you may want to use the BIOS setup program to verify the date/time and boot device. To obtain BIOS updates please contact your local Intel field representative. Pressing the Delete key during boot causes the system to enter into the BIOS setup program.

Theory of Operation 3

3.1 Block Diagram

Figure 2. Block Diagram



3.2 Thermal Management

The objective of thermal management is to ensure that the temperature of each component is maintained within specified functional limits. The functional temperature limit is the range within which the electrical circuits may be expected to meet their specified performance requirements. Operation outside the functional limit may degrade system performance and cause reliability problems.

The development kit is shipped with fansink thermal solutions to be installed on the processor. This thermal solution has been tested in an open air environment at room temperature and is sufficient for evaluation purposes. The designer must ensure that adequate thermal management is provided for any customer-derived designs.

3.3 System Features

The Intel® 855GME Chipset and the Intel® FW82801DB are designed to support the Pentium M processor. The chipset's architecture provides the performance and feature set required for uni-processor-based PCs. The hub interface is designed into the Intel 855GME chipset to provide more efficient communication between chipset components for high-speed I/O. The hub interface provides up to 266 MBytes/s bandwidth, which can be connected to the ICH4. The system bus, used to connect the processor with the 855GME chipset, uses a 400 MT/s transfer rate for data transfers, delivering 3.2 Gbytes/s. The Intel 855GME chipset GMCH system memory controller directly supports one channel of PC1600/2100/2700 DIMM DDR memory. The Intel 855GME chipset GMCH system memory interface supports DDR devices with densities of 128-Mbit, 256-Mbit, and 512-Mbit technology.

3.3.1 Pentium® M Processor

The Pentium M processor is a high performance, lower voltage processor with several micro-architectural enhancements over existing Intel mobile processors. Some key features of the Pentium M processor micro-architecture include:

- Dynamic execution
- Data pre-fetch logic
- 400 MHz source-synchronous FSB
- On-die 1 MByte second level (L2) cache with Advanced Transfer Cache Architecture
- Streaming SIMD Extensions 2 (SSE2)
- Enhanced Intel SpeedStep® technology.

The FSB uses source-synchronous transfer of address and data to improve performance and enable addressing at 2x the system bus frequency and data transfers at 4x the system bus frequency of 100 MHz. This allows the 400 MHz system bus support to transfer data at 3.2 Gbytes/s.

The Pentium M processor includes the advanced micro-architecture features described in the following sections.

3.3.1.1 Architectural Features

- On-die primary 32 Kbyte instruction cache and 32 Kbyte write-back data cache
- On-die 1 MByte L2 cache
- Supports Streaming SIMD Extensions 2 (SSE2)
- Assisted Gunning Transceiver Logic (AGTL+) bus driver technology
- Enhanced Intel SpeedStep technology to enable real-time dynamic switching between multiple voltage and frequency points

- Supports host bus Dynamic Bus Inversion (DINV)
- Dynamic power down of data bus buffers
- BPRI# control to disable address/control buffers

3.3.1.2 Packaging/Power

- 479-ball Micro-FCBGA packages

Note: Requires the use of an interposer to be used in the development kit's PGA board socket. Please contact you local Intel field representative to obtain.

- 478-pin Micro-FCPGA packages
- $V_{CC-CORE}$: 1.484 V (highest frequency mode) to 0.956 V (lowest frequency mode)
- VCCA (1.8 V)
- VCCP (1.05 V)

3.3.1.3 Enhanced Intel SpeedStep® Technology

The Pentium M processor features Enhanced Intel SpeedStep technology. Unlike current implementations of Intel SpeedStep technology, this technology may enable the processor to switch between multiple frequency and voltage points instead of two. This may enable superior performance with optimal power savings. Switching between states may be software controlled, unlike previous implementations where the GHI# pin is used to toggle between two states. Following are the key features of Enhanced Intel SpeedStep technology:

- Multiple voltage/frequency operating points provide optimal performance at the lowest power. A subset of available operating points may be selectable to provide maximum flexibility.
- Voltage/Frequency selection may be software controlled by writing to processor MSRs (Model Specific Registers) thus eliminating chipset dependency.
  - When the target frequency is higher than the current frequency, V_{CC} is ramped up by placing a new value on the VID pins and the PLL then locks to the new frequency.
  - When the target frequency is lower than the current frequency, the PLL locks to the new frequency and then the V_{CC} is changed through the VID pin mechanism.
  - Software transitions are accepted at any time. When a previous transition is in progress, the new transition is deferred until its completion.
- The processor may control voltage ramp rates internally to ensure glitch-free transitions.
- Low transition latency and large number of transitions possible per second.
  - Processor core (including L2 cache) is unavailable for up to 10 µs during the frequency transition.
  - The bus protocol (BNR# mechanism) is used to block snooping during the transition.
- No bus master arbiter disable required prior to transition and no processor cache flush necessary.
- Improved thermal throttling:
  - When the on-die thermal sensor indicates that the die temperature is too high, the processor may automatically perform a transition to a lower frequency/voltage specified in a software-programmable MSR.

— The processor waits for a time period (target value is 1 ms). When the die temperature is down to acceptable levels an up transition to the previous frequency/voltage point occurs.

— An interrupt is generated for up and down throttling transitions, enabling better system level thermal management.

3.3.2 Intel® 855GME Chipset

The Intel® 855GME chipset GMCH component provides the processor interface, SDRAM interface, display interface, and hub interface in an Intel 855GME chipset platform. The Intel 855GME chipset GMCH is optimized for the Mobile Pentium M processor. It supports a single channel of DDR memory. The Intel 855GME chipset GMCH contains advanced power management logic. The Intel 855GME chipset platform supports fourth-generation I/O Controller Hub (ICH4) to provide the features required by a mobile platform.

3.3.2.1 Intel® 855GME Graphics Memory Controller Hub (GMCH)

The Intel® 855GME chipset contains the following functionality:

- Support for Pentium M processor and Celeron M processor at 400MHz FSB
- 2x address, 4x data
- Supports host bus dynamic bus inversion (DBI)
- Supports 64-bit host data bus and 32-bit addressing
- Eight-deep in-order queue
- AGTL+ bus driver technology with integrated AGTL+ termination resistors and low voltage operation (V_{TT} = 1.05V)
- Support for DPWR# signal to Pentium M processor for FSB power management
- Support for 333-MHz DDR SDRAM devices with max of two double-sided DIMMs (four rows populated) with unbuffered PC2700 DDR SDRAM.
- Supports 128-Mbit, 256-Mbit, and 512-Mbit memory technologies
- Dedicated LFP (local flat panel) interface
- Supports data format up to 18-bpp
- AGP 4x support
- Core Vcc = 1.2 V or 1.35 V (1.35 V needed to support Graphics core frequency of 250 MHz and 333-MHz DDR SDRAM devices)

3.3.2.2 Intel® 82801DB I/O Controller Hub (ICH4)

The Intel® 82801DB I/O Controller Hub (ICH4) is a highly integrated multifunctional I/O controller hub that provides the interface to the PCI bus and integrates many of the functions needed in today's PC platforms. The following sections describe the reference board implementation of the Intel ICH4 features.

ICH4 features:

- PCI 2.2 with six PCI REQ/GNT pairs
- Eight PCI interrupts

- AC'97 2.2 with seven channel audio support
- LPC interface
- Wake-On-LAN support
- System management
- 24 GPIO signals
- Interrupt controller
- 82C54-based timer
- ACPI 1.0b compliant
- RTC
- 421 BGA package
- Four IDE @ ATA 100 max
- High-speed USB 2.0 host controller supporting all six ports, USB 1.1 compatible
- Enhanced SMBus 2.0 support with slave interface
- Integrated MAC

3.3.2.3 Intel® 82802AC Firmware Hub (FWH)

A socketed 8 Mbit FLASH device is used to store system BIOS and video BIOS, as well as an Intel® Random Number Generator (RNG). A bootblock locking jumper is provided to allow a mechanical means of protecting the bootblock BIOS firmware. See Section 5.2 for BIOS programming details.

FWH Features:

- 32-pin PLCC package
- 8-Mbit flash memory
- Symmetrically-blocked flash memory array (64 Kbyte)
- Pin and register-based block locking
- Integrated hardware RNG
- Single-byte read/write
- Five GPIs

3.3.3 Boot ROM

The system boot ROM is installed on the Intel® 82802AC FWH device, socketed at U1H1. The FWH is addressable on the LPC bus off the ICH4.

3.3.4 System I/O

The board contains the following I/O devices:

- Three PCI slots
- Floppy controller support

- Primary and secondary IDE interface (supports four drives)
- One serial port
- One parallel port
- Six USB ports (four on the back panel and two on the front header)
- VGA connector
- LVDS connector
- AGP/ADD connector
- AC'97 specification-compliant audio
- Line Out, Line IN, and MIC IN connectors
- PS/2-style keyboard and mouse ports

3.3.4.1 Floppy Disk Drive Support

One 34-pin floppy connector is provided on the board, which will support up to two floppy drives.

3.3.4.2 PCI-LAN-USB-Audio

The Intel® 855GME chipset supports up to six master PCI devices. The integrated LAN Connect Interface is routed to the onboard Intel® 82562EM Platform LAN Connect RJ45. The six USB 2.0 ports are backward compatible to USB 1.1, supporting hi-speed, full-speed, and low-speed devices. Audio has AC’97 support with three CODECs to support full surround sound (six channel audio) and 20-bit audio.

3.3.4.3 IDE Support

The board supports both a primary and secondary IDE interface through two 40-pin IDE connectors.

There are two IDE channel connectors: primary and secondary. Each channel allows two IDE devices per channel. Supports UltraATA/33/66/100 interfacing.

3.3.4.4 RS-232 Serial Port

The board provides one built-in serial port.

3.3.4.5 IEEE 1284 Parallel Port

One 25-pin DSUB IEEE 1284 Standard/EPP/ECP parallel port is provided on the board.

3.3.4.6 USB Ports

The board has four USB 2.0 connectors on the back panel.

3.3.4.7 VGA Port

The VGA port is a 15-pin DSUB female connector for output to a monitor.

3.3.4.8 LVDS Connector

The LVDS connector is used for output to a LVDS TFT panel. The Intel 855GME LVDS interface connector is based on the *Common Panel Interface Specification, Rev 1.5*.

3.3.4.9 AGP/ADD Connector

The board has one AGP 4X/1.5 V connector. The Intel 855GME with Intel FW82801DB Chipset Development Kit supports AGP 2.0 specification.

The board also provides electrical and mechanical support for AGP Digital Display (ADD) cards when using the integrated graphics capability of the 855GME. However the BIOS included with the kit does not provide support for ADD cards. Please work with your BIOS vendor to enable your specific ADD card.

A jumper is required to identify whether an AGP card or ADD card is inserted. Refer to Table 3, "Jumper Settings" on page 15 for details.

3.3.4.10 Keyboard/Mouse Ports

There is one stacked PS/2 connector for a keyboard and mouse. The top connector is for the mouse, and the bottom connector is for the keyboard.

3.3.4.11 32-bit/33-MHz PCI Connectors

Three industry standard 32-bit/33-MHz PCI connectors are provided on the board.

3.3.5 Post Code Debugger

An on-board Post Code Debugger is implemented directly on the board.

3.3.6 In-Target Probe (ITP)

The board contains an in-target probe (ITP) connector for an ITPFlex. You must use an ITPFlex, which is specific to the Pentium M processor. Other ITPs will not work and if installed could damage the platform and/or the ITP.

3.3.7 Clock Generation

The clock synthesizer on the baseboard generates and distributes the clocks used by the entire system.

3.3.7.1 System Clocks

The CK408 Clock Synthesizer is the primary source of clock generation for most of the clocks on the baseboard. The following clock groups are found on the Pentium M processor and Intel 855GME Chipset Scalable Performance Board Development Kit. For more information on these clocks, see the *Pentium® M Processor and Intel® 855GME Chipset Embedded Platform Design Guide*. Table 4 presents the system clocks.

Table 4. System Clocks

Clock Name	Clock Speed
CPU	100 MHz
PCI	33 MHz
DOT	48 MHz
3V66	66 MHz
REF0	14.318 MHz
USB	48 MHz
APIC	33 MHz

3.3.8 Power Supply Requirements

The Pentium® M processor, Intel® 855GME Chipset and Intel® FW82801DB Development Kit uses an ATX power supply.

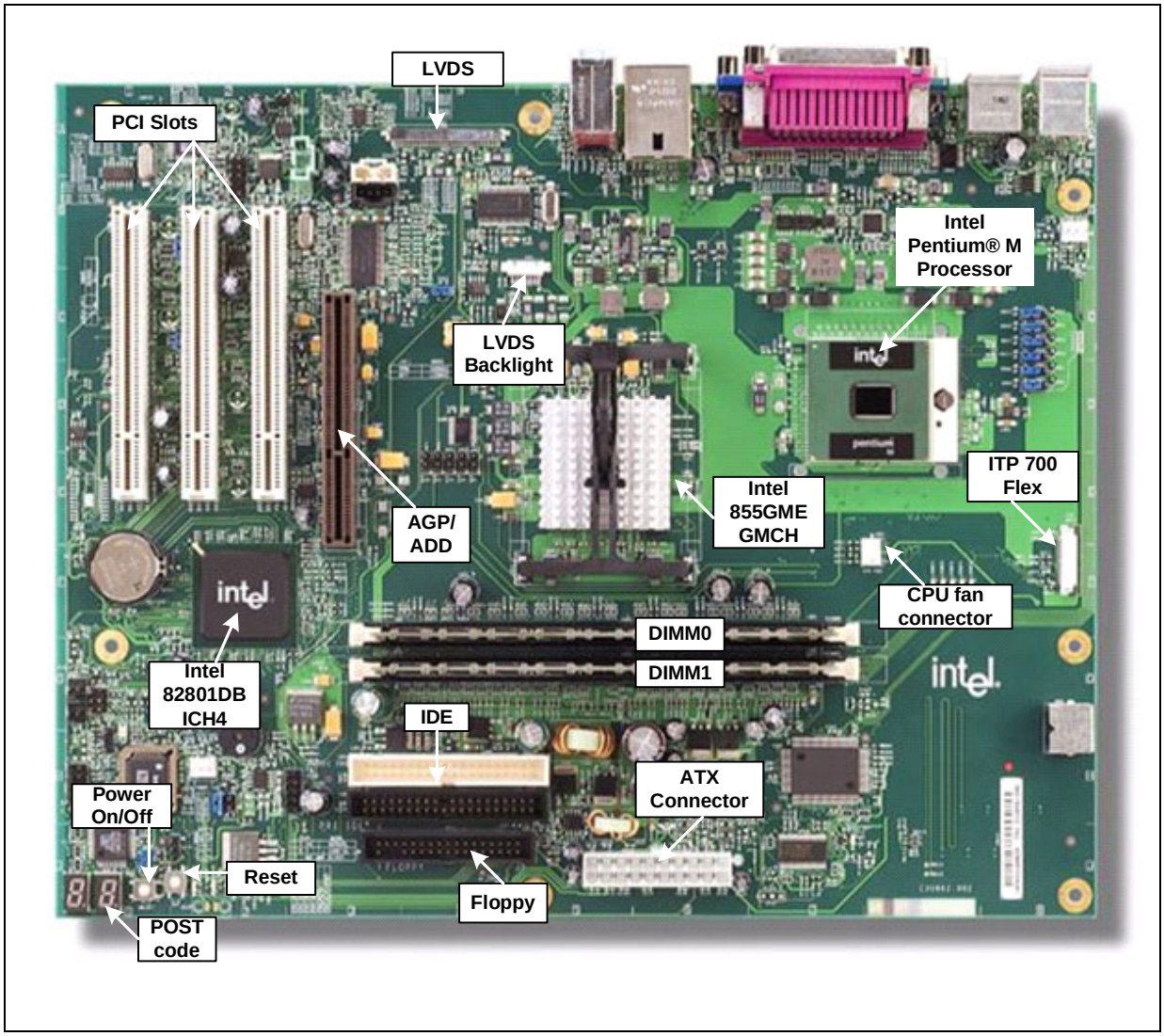
3.4 Battery Requirements

A type 2032 3 V lithium coin cell battery is included on the board.

Hardware Reference 4

This section provides reference information on the hardware, including locations of board components, connector pinout information, and jumper settings. Figure 3 shows the board layout diagram.

Figure 3. Board Layout Diagram



4.1 Chipset and Major Board Components

Table 5. Chipset and Major Board Components

Component Designator	Component Description
U5E1	Intel® 855GME Graphics Memory Controller Hub (GMCH)
U2F1	Intel® FW82801DB (ICH-4)
U8D1	Pentium® M processor
U5B1	Intel® 82562 EM

4.2 Expansion Slots and Sockets

Table 6. Expansion Slots and Sockets

Slot/Socket Reference Designator	Slot/Socket Description
U8D1	Processor Socket
J4A1	LVDS Connector
J5C1	LVDS Panel Backlight
J3C1	AGP/ADD Slot
J1B1	32/33 PCI Slot
J2B1	32/33 PCI Slot
J2B2	32/33 PCI Slot
J3G1	DDR DIMM
J3G2	DDR DIMM
U1H1	Firmware Hub (FWH) BIOS Socket
BT1F1	Battery

4.2.1 32-Bit PCI Slot Connector

Table 7 presents the signals assigned to the 32-bit PCI slot connector.

Table 7. Signals Assigned to the 32-bit PCI Slot Connector (Sheet 1 of 2)

Pin	Signal	Name	Pin	Signal	Name	Pin	Signal
A1	TRST#	B1	-12 V	A32	AD16	B32	AD17
A2	+12 V	B2	TCK	A33	3.3 V	B33	C/BE2#
A3	TMS	B3	GND	A34	FRAME#	B34	GND
A4	TDI	B4	TDO	A35	GND	B35	IRDY#
A5	5 V	B5	5 V	A36	TRDY#	B36	3.3 V
A6	INTA#	B6	5 V	A37	GND	B37	DEVSEL#
A7	INTC#	B7	INTB#	A38	STOP#	B38	GND
A8	5 V	B8	INTD#	A39	3.3 V	B39	LOCK#
A9	Reserved	B9	PRSNT1#	A40	SMBCLK	B40	PERR#
A10	5 V	B10	Reserved	A41	SMBDATA	B41	3.3 V

Table 7. Signals Assigned to the 32-bit PCI Slot Connector (Sheet 2 of 2)

Pin	Signal	Name	Pin	Signal	Name	Pin	Signal
A11	Reserved	B11	PRSNT2#	A42	GND	B42	SERR#
A12	GND	B12	GND	A43	PAR	B43	3.3 V
A13	GND	B13	GND	A44	AD15	B44	C/BE1#
A14	3.3 V_{AUX}	B14	Reserved	A45	3.3 V	B45	AD14
A15	RST#	B15	GND	A46	AD13	B46	GND
A16	5 V	B16	CLK	A47	AD11	B47	AD12
A17	GNT#	B17	GND	A48	GND	B48	AD10
A18	GND	B18	REQ#	A49	AD9	B49	GND
A19	PME#	B19	5 V	A50	KEY	B50	KEY
A20	AD30	B20	AD31	A51	KEY	B51	KEY
A21	3.3 V	B21	AD29	A52	CBEO#	B52	AD8
A22	AD28	B22	GND	A53	3.3 V	B53	AD7
A23	AD26	B23	AD27	A54	AD6	B54	3.3 V
A24	GND	B24	AD25	A55	AD4	B55	AD5
A25	AD24	B25	3.3 V	A56	GND	B56	AD3
A26	IDSEL	B26	C/BE3#	A57	AD2	B57	GND
A27	3.3 V	B27	AD23	A58	AD0	B58	AD1
A28	AD22	B28	GND	A59	5 V	B59	5 V
A29	AD20	B29	AD21	A60	REQ64#	B60	ACK64#
A30	GND	B30	AD19	A61	5 V	B61	5 V
A31	AD18	B31	3.3 V	A62	5 V	B62	5 V

4.2.2 AGP/ADD Connector

Table 8 represents the AGP/ADD slot connector pinout.

Table 8. AGP Slot connector pinout (Sheet 1 of 2)

Pin	B	A	Pin	B	A	Pin	B	A
1	OVRCT#	12V	23	GND	GND	45	KEY	KEY
2	5.0V	TYPEDET#	24	3.3V AUX	Reserved	46	DEVSEL	TRDY
3	5.0V	GC_DET#	25	VCC3.3	VCC3.3	47	Vddq1.5	STOP
4	USB+	USB-	26	AD31	AD30	48	PERR	PME#
5	GND	GND	27	AD29	AD28	49	GND	GND
6	INTB#	INTA#	28	VCC3.3	VCC3.3	50	SERR	PAR
7	CLK	RST#	29	AD27	AD26	51	C#/BE1	AD15
8	REQ	GNT	30	AD25	AD24	52	Vddq1.5	Vddq1.5
9	VCC3.3	VCC3.3	31	GND	GND	53	AD14	AD13
10	ST0	ST1	32	AD_STBF1	AD_STBS1	54	AD12	AD11

Table 8. AGP Slot connector pinout (Sheet 2 of 2)

Pin	B	A	Pin	B	A	Pin	B	A
11	ST2	MB_DET#	33	AD23	C#/BE3	55	GND	GND
12	RBF	DBI_HI	34	Vddq1.5	Vddq1.5	56	AD10	AD9
13	GND	GND	35	AD21	AD22	57	AD8	C#/BE0
14	DBI_LO	WBF	36	AD19	AD20	58	Vddq1.5	Vddq1.5
15	SBA0#	SBA1#	37	GND	GND	59	AD_STBF0	AD_STBS0
16	VCC3.3	VCC3.3	38	AD17	AD18	60	AD7	AD6
17	SBA2#	SBA3#	39	C#/BE2	AD16	61	GND	GND
18	SB_STBF	SB_STBS	40	Vddq1.5	Vddq1.5	62	AD5	AD4
19	GND	GND	41	IRDY	FRAME	63	AD3	AD2
20	SBA4#	SBA5#	42	KEY	KEY	64	Vddq1.5	Vddq1.5
21	SBA6#	SBA7#	43	KEY	KEY	65	AD1	AD0
22	Reserved	Reserved	44	KEY	KEY	66	AGPVrefcg	AGPVrefgc

4.2.3 Processor Socket

There is one 478-pin µ-FCPGA processor socket on the board. The processor is keyed so that it fits into the socket in one particular orientation. The socket is released by lifting the cam lever.

Note: Do not force the processor into the socket, or you may damage the processor and/or socket. The board is designed to support future processor speeds.

4.2.4 Firmware Hub (FWH) BIOS Socket

The Firmware Hub (FWH), or BIOS, flash memory part fits into the 32-pin socket U1H1, giving you the option to remove and reprogram it without the use of soldering equipment. There is only one correct orientation for the FWH part to be placed into its socket. Line up the circular marking on the FWH part, denoting pin 1, with the circular marking on the board. Pin numbering proceeds clockwise around the chip from pin 1.

4.2.5 Battery

A type 2032 3 V lithium coin cell battery is used in socket BT1F1 on the board. The battery holder is beveled such that the battery fits into it in one particular orientation. The battery is held in place by a metal arm. To remove the battery, bend the arm slightly and pull the battery out.

4.2.6 Board Mounted Power Control and Reset Switches

Two switches are provided on the reference board. A power button is connected in parallel to the front panel header pins and to a reset switch. These buttons provide manual power and reset control when the board is not mounted in a chassis.

4.3 On-Board Connectors

Table 9. On-Board Connectors

Connector Reference Designator	Connector Description
J6J5	ATX Power Connector
J3H3	Primary IDE Connector
J3H1	Secondary IDE Connector
J3J1	Floppy Connector
J9F1	Mini - ITP - 28P Connector
J9B1	Auxiliary Fan Connector
J8E1	CPU Fan Connector
J4A1	LVDS Connector

4.3.1 ATX Power Connectors

Table 10 represents the signals for the ATX power connector J6J5.

Table 10. Power Connector Pinout (J6J5)

Pin	Signal Name	Function
1	3.3 V	3.3 V
2	3.3 V	3.3 V
3	GND	Ground
4	+ 5 V	+5 V VCC
5	GND	Ground
6	+ 5 V	+5 V VCC
7	GND	Ground
8	PWRGD	Power Good
9	5 VSB	Standby 5 V
10	+ 12 V	+12 V
11	3.3 V	3.3 V
12	-12 V	-12 V
13	GND	Ground
14	PS_ON#	Soft-off control
15	GND	Ground
16	GND	Ground
17	GND	Ground
18	-5 V	-5 V
19	+5 V	+5 V VCC
20	+5 V	+5 V VCC

4.3.2 IDE Connector

Table 11 represents the signals for the IDE connector J3H3.

Table 11. IDE Connector Pinout (J3H3)

Pin	Signal	Pin	Signal
1	Reset IDE	21	PDDREQ
2	Ground	22	Ground
3	Host Data 7	23	I/O Write#
4	Host Data 8	24	Ground
5	Host Data 6	25	I/O Read#
6	Host Data 9	26	Ground
7	Host Data 5	27	IOCHRDY
8	Host Data 10	28	Ground
9	Host Data 4	29	PDDACK
10	Host Data 11	30	Ground
11	Host Data 3	31	IRQ14
12	Host Data 12	32	Reserved
13	Host Data 2	33	Addr1
14	Host Data 13	34	Primary IDE Cable Detect
15	Host Data 1	35	Addr 0
16	Host Data 14	36	Addr 2
17	Host Data 0	37	Chip Select 0#
18	Host Data 15	38	Chip Select 1#
19	Reserved	39	Activity
20	Key	40	Ground

4.3.3 Floppy Drive Connector

Table 12 represents the signals assigned to the floppy drive connector J3J1.

Table 12. Floppy Drive Connector Pinout (J3J1)

Pin	Signal	Pin	Signal
1	Ground	2	Drive Enable 0
3	Ground	4	Reserved
5	Key	6	Drive Enable 1
7	Ground	8	Index
9	Ground	10	Motor Enable A#
11	Ground	12	Reserved
13	Ground	14	Drive Select A#
15	Ground	16	Reserved
17	Reserved	18	DIR#
19	Ground	20	STEP#
21	Ground	22	Write Data#
23	Ground	24	Write Gate#
25	Ground	26	Track 00#
27	Reserved	28	Write Protect#
29	Ground	30	Read Data#
31	Ground	32	Side 1 Select#
33	Ground	34	Diskette Change#

4.3.4 ITP700FLEX Connector

See Section 3.3.6 and ITP documentation for information on the In-Target Probe (ITP).

4.3.5 Fan Connectors

There are three 12 V fan connectors on the board. Use connector J8E1 for the CPU fansink. If you choose to install another 12 V fan or fansink on your board, you can use the two auxiliary fan connectors J9B1 and J2H1.

4.4 DDR SDRAM Slots

The board contains two DIMM slots for DDR SDRAM. Table 13 presents the DDR SDRAM slot designator and corresponding description.

Table 13. DDR SDRAM Slots

DDR SDRAM Slot Designator	DDR SDRAM Slot Description
J3G1	DIMM 0
J3G2	DIMM 1

4.4.1 Voltage Identification for the Pentium® M Processor

There are six voltage identification pins on the Pentium M processor. These signals may be used to support automatic selection of V_{CC_CORE} voltages and are needed to cleanly support voltage specification variations on current and future processors. VID[5:0] is defined in Table 14.

Table 14. VID vs. V_{CC_CORE} Voltage

VID						V_{CC_CORE}	VID						V_{CC_CORE}
5	4	3	2	1	0	V	5	4	3	2	1	0	V
0	0	0	0	0	0	1.708	1	0	0	0	0	0	1.196
0	0	0	0	0	1	1.692	1	0	0	0	0	1	1.180
0	0	0	0	1	0	1.676	1	0	0	0	1	0	1.164
0	0	0	0	1	1	1.660	1	0	0	0	1	1	1.148
0	0	0	1	0	0	1.644	1	0	0	1	0	0	1.132
0	0	0	1	0	1	1.628	1	0	0	1	0	1	1.116
0	0	0	1	1	0	1.612	1	0	0	1	1	0	1.100
0	0	0	1	1	1	1.596	1	0	0	1	1	1	1.084
0	0	1	0	0	0	1.580	1	0	1	0	0	0	1.068
0	0	1	0	0	1	1.564	1	0	1	0	0	1	1.052
0	0	1	0	1	0	1.548	1	0	1	0	1	0	1.036
0	0	1	0	1	1	1.532	1	0	1	0	1	1	1.020
0	0	1	1	0	0	1.516	1	0	1	1	0	0	1.004
0	0	1	1	0	1	1.500	1	0	1	1	0	1	0.988
0	0	1	1	1	0	1.484	1	0	1	1	1	0	0.972
0	0	1	1	1	1	1.468	1	0	1	1	1	1	0.956
0	1	0	0	0	0	1.452	1	1	0	0	0	0	0.940
0	1	0	0	0	1	1.436	1	1	0	0	0	1	0.924
0	1	0	0	1	0	1.420	1	1	0	0	1	0	0.908
0	1	0	0	1	1	1.404	1	1	0	0	1	1	0.892
0	1	0	1	0	0	1.388	1	1	0	1	0	0	0.876
0	1	0	1	0	1	1.372	1	1	0	1	0	1	0.860
0	1	0	1	1	0	1.356	1	1	0	1	1	0	0.844
0	1	0	1	1	1	1.340	1	1	0	1	1	1	0.828
0	1	1	0	0	0	1.324	1	1	1	0	0	0	0.812
0	1	1	0	0	1	1.308	1	1	1	0	0	1	0.796
0	1	1	0	1	0	1.292	1	1	1	0	1	0	0.780
0	1	1	0	1	1	1.276	1	1	1	0	1	1	0.764
0	1	1	1	0	0	1.260	1	1	1	1	0	0	0.748
0	1	1	1	0	1	1.244	1	1	1	1	0	1	0.732
0	1	1	1	1	0	1.228	1	1	1	1	1	0	0.716
0	1	1	1	1	1	1.212	1	1	1	1	1	1	0.700

4.5 Buttons

The board has power and reset buttons. Table 15 presents the switch reference designation and corresponding button description.

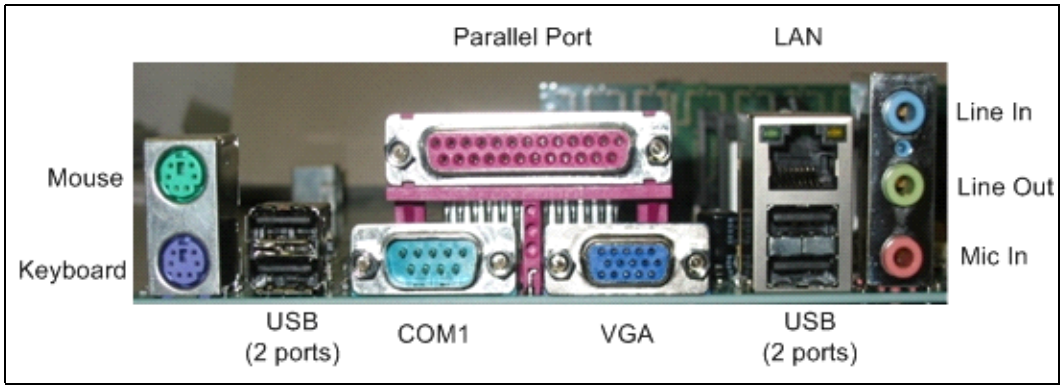
Table 15. Buttons

Switch Reference Designator	Switch Description
J1J2	Power Button
J1J3	Reset Button

4.6 Peripheral Connectors

The board contains a number of connectors for external system devices and peripherals. Figure 4 shows the peripheral connectors.

Figure 4. Peripheral Connectors



4.6.1 Dual Stacked USB Connector

Table 16 presents the signals assigned to the dual stacked USB connector.

Table 16. USB Connector Pinout

Pin	Signal
1,5	Power (fused)
2,6	USBP0# [USBP1#]
3,7	USBP0 [USBP1]
4,8	Ground

4.6.2 PS/2-Style Mouse and Keyboard Connectors

Table 17 presents the signals assigned to the PS/2-style keyboard and mouse connectors. The keyboard port is on the bottom, and the mouse port is on the top.

Table 17. PS/2-Style Mouse and Keyboard Pinout

Pin	Signal
1, 7	Data
2,8	Reserved
3,9	Ground
4,10	+5 V (fused)
5,11	Clock
6,12	Reserved

4.6.3 VGA Port

Table 18 presents the signals assigned to the VGA port.

Table 18. VGA Port Signals

Pin	Signal
1	Red
2	Green
3	Blue
4	Reserved
5	Ground
6	Analog Ground
7	Analog Ground
8	Analog Ground
9	V_{CC}
10	Ground
11	Reserved
12	DDC Data
13	Horizontal Sync
14	Vertical Sync
15	DDC Clock

4.6.4 Parallel Port

Table 19 presents the signals assigned to the parallel port connector.

Table 19. Parallel Port Connector Pinout

Pin	Signal	Pin	Signal
1	Strobe#	14	Auto Feed#
2	Data Bit 0	15	Fault#
3	Data Bit 1	16	INIT#
4	Data Bit 2	17	SLC IN#
5	Data Bit 3	18	Ground
6	Data Bit 4	19	Ground
7	Data Bit 5	20	Ground
8	Data Bit 6	21	Ground
9	Data Bit 7	22	Ground
10	ACK#	23	Ground
11	Busy	24	Ground
12	Paper end	25	Ground
13	SLCT		

4.6.5 Serial Ports

Table 20 presents the signals assigned to the serial port connector.

Table 20. Serial Port Connector Pinout

Pin	Signal
1	DCD
2	Serial In (SIN)
3	Serial Out (SOUT)
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	RI

BIOS Overview 5

The 855GME BIOS was created using AMIBIOS8* technology created by AMI*.

The following documents are available to overview the high-level features of AMIBIOS8:

- Amibios8.pdf
- AMIBIO8Brochure.pdf
- AboutAMIBIOS8.pdf

These files, and others, are also available for download from AMI's website (http://www.ami.com).

5.1 Power-On and Configuration

5.1.1 Power On

Upon power-on, the 855GME BIOS will initialize the board hardware and peripherals, communicating its progress by writing status codes to an I/O port (80h). These status codes may be monitored at the on-board post code debugger .

Documentation on the status codes sent to port 80h is available in the file AMIBIOS-codes.pdf. This file can be downloaded from AMI's website (http://www.ami.com).

After most of the hardware has been configured, including video (whether it be on-board or PCI), the user is presented with a splash screen. This splash screen displays the following information:

- BIOS information, such as build time and version
- CPU configuration
  - — Number of CPUs in the system
  - — Speed of the CPUs
  - — Brand string
  - — Family/Model/Stepping
  - — Microcode update loaded

All of memory is then tested, and the progress of the test is displayed on the screen. This memory test may be skipped by pressing the <ESC> key at any time during the test.

Following the memory test, IDE devices are detected. If CMOS memory has been corrupted or is otherwise invalid, you will be prompted to load default CMOS data and continue or enter the setup utility. Press <F1> to enter the setup utility or press <F2> to load default values into CMOS and continue.

After the IDE devices are displayed, the current hardware configuration is shown, and the boot device is chosen. Then control is handed over to the boot loader on the selected boot device.

5.1.2 BIOS Setup Configuration

The 855GME BIOS provides a setup utility to customize your board. At any point during the display of the first splash screen, pressing the <DEL> key will enter BIOS setup.

The BIOS Setup utility has been functionally divided into five sections to categorize the setup options:

- Main
- Advanced
- PCI/PNP (not discussed here)
- Boot
- Security (not discussed here)
- Chipset
- Exit

These sections can be navigated using all four arrow keys. The <UP> and <DOWN> keys toggle between setup options in any given section. The <LEFT> and <RIGHT> keys switch between main BIOS setup sections. Each of these sections will be discussed briefly, in turn.

5.1.3 Help on Options

It should be noted that not all setup options are documented in this guide. The setup utility in the BIOS contains brief help descriptions for almost every setup option available. When any given setup option is highlighted (selected by moving the cursor to the item with the arrow keys), a brief description of that option is displayed in a pane on the right-hand side of the screen.

5.1.4 Main Setup

The Main BIOS setup screen contains mostly informative information on the BIOS. The following information is displayed:

- BIOS version
- BIOS build date
- BIOS ID

Please use this information when engaging with Intel customer support.

5.1.4.1 Time and Date

The Main Setup section contains fields to control the date and the time of the system. These should be set the first time the setup utility is entered.

5.1.5 Advanced Setup

The Advanced BIOS setup screen contains various menu items that allow you to configure the following system components:

- CPU
- IDE (not discussed here)
- Floppy (not discussed here)
- ACPI (not discussed here)
- Event Log (not discussed here)
- Super I/O (not discussed here)
- USB (not discussed here)
- Onboard Devices

5.1.5.1 CPU Configuration

5.1.5.1.1 CPU Frequency Multiplier

The 855GME board adaptation allows for the user to set the operating frequency of the processors in the system. The CPU Frequency Multiplier field accepts a decimal number representing the processor's internal clock multiplier ratio. The following equation defines how this field affects processor operating frequency:

Processor Frequency = (CPU Frequency Multiplier) * (FSB Frequency) / 4

For example, a CPU Frequency Multiplier value of "20" on a board that is populated with 400 MHz FSB processors will result in an effective processor operating frequency of 2.0 GHz.

It should be noted that not all multipliers are allowable. While the setup option may allow a value to be entered, it is not guaranteed that the entered multiplier will actually result in the intended processor frequency. The effective frequency of the processor depends on the supported frequency range of the processor. If a value entered in this option is not explicitly supported by the processor, the system should exhibit the following behavior:

- If the multiplier would target a processor frequency of below 1.2 GHz, the system will strap to 800 MHz
- If the multiplier would target a processor frequency between 1.2 GHz and the lowest supported processor frequency, the system will strap to the lowest supported processor frequency.
- If the multiplier would target a processor frequency above the highest supported processor frequency, the system will strap to the highest supported processor frequency.

5.1.5.2 Onboard Device Configuration

The Advanced Setup section allows limited configuration of non-chipset devices. The onboard 10/100 Ethernet controller and onboard SCSI controller may be enabled or disabled here. If either device is not used, it is recommended that they be disabled to improve boot time.

5.1.6 Boot Setup

The Boot Setup section contains options that controls boot devices, boot order, and other aspects of the boot process. Most of these options will not be documented here.

5.1.6.1 Quick Boot

The Quick Boot option determines whether or not a complete memory test is performed by the BIOS during boot. Enabling this option will speed up boot time of large memory configurations greatly. It is disabled by default.

5.1.7 Chipset Setup

This setup section contains options that allow the user to configure various parameters that are specific to the chipset silicon present on the board. The following silicon is configurable through this setup section:

- 855GME
- ICH4

5.1.8 Exit

After BIOS setup modifications have been done, you have several choices for leaving the setup utility, which are displayed on the Exit Setup screen:

- Save and Exit (F10)
- No Save and Exit
- Discard Changes (F7)
- Load Optimal Defaults (F8)
- Load Failsafe Defaults (F9)

5.1.8.1 Save Changes and Exit

This option can be chosen to save all changes made to CMOS configuration since entering BIOS setup utility and rebooting the system. All changes made in the setup utility will take affect on the subsequent boot.

5.1.8.2 Discard Changes and Exit

This option can be chosen to exit the setup utility without saving any CMOS configuration changes that have been made. Choosing this option will allow the boot to continue from where it left off before entering the setup utility.

5.1.8.3 Discard Changes

If you have made changes that you wish to undo, this option can be used to restore the CMOS buffer to the same state it was in at setup utility entry.

5.1.8.4 Load Optimal/Failsafe Defaults

Both of these options load a pre-programmed set of configuration data to CMOS.

5.1.8.5 Shortcuts

In addition to using the Exit Setup screen to choose your method of leaving the setup utility, you can also use function keys (noted above) from any point inside the setup utility.

5.2 Updating the BIOS

AMI provides an MS-DOS utility that may be used to replace the BIOS on your 855GME board with a newer version. The utility may be invoked via MS-DOS command line with one parameter, being the .rom file that represents the new BIOS image. The .rom file may be located in any location in the system accessible from MS-DOS.

This utility, along with instructions, is available for download from AMI's website (http://www.ami.com). Although the name of the actual executable file changes from release to release, this tool is packaged under the name AMIFLASH.

5.3 Troubleshooting

5.3.1 Error Messages

In some situations, you may be faced with error messages from the BIOS. AMIBIOS-Error-Messages.pdf describes some of the messages you may see. This document, along with others, is available online from AMI's website (http://www.ami.com/).

5.3.2 Status Codes

During the boot process, the 855GME BIOS communicates its progress to the user by writing status codes to an I/O port (80h). These status codes may be monitored by installing a POST diagnostic card in the short debug PCI slot.

Documentation on the status codes that are sent to port 80h is in the file AMIBIOS-codes.pdf which is available for download from AMI's website (http://www.ami.com/).

5.3.3 Fatal Error Codes

Some memory configurations may cause the system to stop because the BIOS can no longer function. These conditions are specific to the 855GME board adaptation, and are not documented with the reset of the POST codes in the AMI documentation. Table 21 details the possible board-specific fatal error codes that may be observed:

Table 21. Board-Specific Fatal Error Codes

POST Code	Name	Description
E1	Memory Not Present	Make sure memory is populated in the system. If memory has been populated in the system, it is possible that the BIOS skipped DIMMs that are not valid for the current board configuration, and had no valid DIMMs to initialize.
E2	Memory Type Mismatch	Memory has been placed in the system that is not Registered ECC x72 DDR. Check all DIMMs.
E3	Memory Width Error	The silicon on the board doesn't support the DRAM width of one of the DIMMs populated on the board. Check the width of all DIMMs and replace any non-supported DIMMs.
E4	Memory Channel Mismatch	At least one DIMM pair (channel A and channel B) do not match, or only one DIMM is populated in the socket pair.
EA	Memory Timing Error	At least one DIMM has been placed in the system that is not fast enough to run in the current configuration. Inspect and replace slow DIMMs.
EE	Memory Size Not Supported	The size of at least one DIMM is not supported by the BIOS. Inspect and replace any unsupported DIMMs.
EF	DIMM Population Order Error	Mixed single-rank and double-rank DIMMs have been populated in the wrong order. Reorder the DIMMs such that any of the double-rank DIMMs are farther from the MCH than any of the single-rank DIMMs.

Note: The BIOS contained on your board may not generate all of the error codes listed above.

Bill of Materials A

This appendix includes the latest bill of materials as of this printing. To obtain the latest version of the bill of materials, contact your local Intel representative.

This list is provided for convenience. Intel does not endorse third party vendor products. The designer is responsible for verifying compatibility with Intel products.

Table 22. Bill of Materials (Sheet 1 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
1		PKG MATL KIT	FOAM PACK INC.*	659244-001
1		ASSY,HTSNK,BGA,T710	FOXCONN ELECTRONICS, INC.*	PHC029C02012
1		LBL,BLANK,4.00X6.00,WHT,THRM	INTERMEC MEDIA*	E01918
1		LBL,PRPT,WARN,1.5X3,ORG,PAPR	NO VENDOR CONTROL	SPEC CONTROL PART
1		BAG,12X16,0.0033,SWLD,LAM,ESD S,PRNT	RICHMOND TECHNOLOGY*	146963-014
1	BT1F1	BAT,CELL,3.0V,200MAH,LI	MAXELL CORPORATION OF AMERICA*	CR2032
37	C1A1, C1A4, C2N1, C2N2, C2N3, C2N4, C2N5, C2N6, C2P2, C2P3, C2P4, C2P5, C2P6, C2P7, C2P8, C2P11, C2P12, C2P15, C2P16, C2P17, C2P18, C2P19, C2P20, C2P21, C3N1, C3N2, C3N3, C3N4, C3N5, C3N6, C3N7, C3P1,C3P2, C3P3, C3P9, C3P10, C3P11	CAPC,X5R,0805,10.000 UF, 6.300V,+/- 20%	AVX CERAMICS CORP*	08056D106MAT4A
2	C1A11, C2A29	CAPC,C0G,0402,22.000 PF, 50.000V,+/- 5%	TDK CORPORATION OF AMERICA*	C1005C0G1H220JT009A
3	C1A2, C5A2, C5A3	CAPC,X7R,0402,470.000 PF, 50.000V,+/- 10>	AVX CERAMICS CORP	04025C471KAT4A
1	C1A3	CAPC,X7R,0402,4700.000 PF, 16.000V,+/- 1>	TDK CORPORATION OF AMERICA*	C1005X7R1E472KT
19	C1A5, C1A8, C1H4, C2A7, C2A13, C2A19, C2A21, C2A23, C2B3, C2G6,C2G10, C2J1, C3A5, C3A7, C3A10, C3A11, C5A1, C6H4, C7H5	CAPC,Y5V,0603,1.000 UF, 10.000V,+80/-20%>	TDK CORPORATION OF AMERICA	C1608Y5V1A105ZT009N
9	C1A6, C1A9, C1A10, C2A14, C2A27, C2A30, C3A3, C3A8, C3B3	CAPC,Y5V,0402,0.100 UF, 16.000V,+80/-20%>	TDK CORPORATION OF AMERICA	C1005Y5V1C104ZT009N

Table 22. Bill of Materials (Sheet 2 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
152	C1B3, C1B5, C1C1, C1C2, C1C3, C1C5, C1C6, C1D1, C1D2, C1D6, C1F2,C1G3, C1G9, C1G10, C1H1, C2C1, C2C3, C2C4, C2D1, C2D3, C2D4, C2D6,C2E2, C2E4, C2E5, C2E6, C2E7, C2E8, C2F1, C2F2, C2F3, C2G1, C2G2, C2G3, C2G4, C2H2, C3B22, C3C4, C3C11, C3D9, C3E2, C3E8,	CAPC,Y5V,0603,0.100 UF, 25.000V,+80/-20%>	TDK CORPORATION OF AMERICA	C1608Y5V1E104ZT009N
6	C1D4, C2A1, C2B8, C2C2, C3A9, C6H2	CAPA,100.000 UF, 6X12,25.000V,+/-20%, RD>	UNITED/NIPPON CHEMICON*	SMG25VB101M6X11LL
6	C1E3, C2G5, C3E6, C5J5, C5J7, C6J4	CAPA,22.000 UF, 5X12,25.000V,+/-20%, RD	PANASONIC INDUSTRIAL*	ECEA1EU220B
2	C1G2, C7J4	CAPC,C0G,0603,47.000 PF, 50.000V,+/- 5%	TDK CORPORATION OF AMERICA	C1608C0G1H470JT009A
114	C1H6, C1J1, C1J2, C1J3, C2P1, C2P9, C2P10, C2P13, C2P14, C3B9,C3B12, C3B14, C3B15, C3B19, C3B21, C3B25, C3B26, C3C5, C3C8, C3C12,C3D1, C3D4, C3D5, C3D8, C3E7, C3F2, C3F3, C3F8, C3G1, C3M3, C3M4,C3P4, C3P5, C3P6, C3P7, C3P8, C4A1, C4B8, C4D1, C4D2, C4D3	CAPC,X7R,0603,0.100 UF, 16.000V,+/- 10%	TDK CORPORATION OF AMERICA	C1608X7R1C104KT009T
14	C2A17, C2A18, C2A20, C2A22, C2A24, C2A25, C2A26, C2M1, C3M1, C3M2,C4C5, C5P4, C6E4, C9A2	CAPC,X5R,0603,1.000 UF, 6.300V,+/- 20%	TDK CORPORATION OF AMERICA	C1608X5R0J105MT009N
1	C2A2	CAPC,X5R,0402,0.100 UF, 10.000V,+/- 10%	TDK CORPORATION OF AMERICA	C1005X5R1A104KT009N
10	C2A28, C3B6, C3B7, C3C10, C4A7, C4B5, C4C1, C5A9, C5H4, C6H9	CAPC,Y5V,1206,4.700 UF, 16.000V,+80/-20%>	TDK CORPORATION OF AMERICA	C3216Y5V1C475ZT0K9N
4	C2A3, C2A5, C2A10, C2A11	CAPC,C0G, 0603, 270.000 PF, 50.000V,+/- 5%>	AVX CERAMICS CORP	06035A271JAT$A
1	C2B1	CAPC,C0G,0402,5.600 PF,50.000V,+/- 0.5P>	AVX CERAMICS CORP	04025A5R6DAT4A
4	C2B10, C2H6, C2J2, C4B2	CAPC,X7R,0603,1000.000 PF, 50.000V,+/- 1>	MURATA ELEC. NORTH AMERICA*	GRM39X7R102K050AJ
2	C2B2, C5J6	CAPC,Y5V,0805,1.000 UF, 16.000V,+80/-20%>	TDK CORPORATION OF AMERICA	C2012Y5V1C105ZT009N

Table 22. Bill of Materials (Sheet 3 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
1	C2G7	CAPC,X7R,0603,0.047 UF, 16.000V,+/- 10%	TDK CORPORATION OF AMERICA	C1608X7R1C473KT009N
4	C2G9, C2G11, C7B5, C7B8	CAPC,C0G,0603,10.000 PF, 50.000V,+/- 0.5>	TDK CORPORATION OF AMERICA	C1608C0G1H100DT009A
1	C2M2	CAPC,X7R,0603,0.047 UF, 16.000V,+/- 5%	TDK CORPORATION OF AMERICA	C1608X7R1C473JT009N
1	C3A2	CAPC,C0G,0402,47.000 PF, 50.000V,+/- 5%	TDK CORPORATION OF AMERICA	C1005C0G1H470JT009A
1	C3B1	CAPA,10.000 UF, 5X12, 35.000V,+/- 20%, RD	NICHICON CORPORATION*	UVR1V100MDA1CM
6	C3C13, C3C15, C3D2, C3D7, C5C3, C5C4	CAPT,B,22.000 UF, 10.000V,+/- 20%	KEMET*	T491B226M010AS7454
17	C3C14, C5J9, C5J10, C6A4, C6B2, C6B3, C6B4, C6B5, C6J1, C7B3, C8B6,C9A1, C9A3, C9A4, C9A6, C9A7, C9A8	CAPC,X7R,0603,470.000 PF, 50.000V,+/- 10>	KEMET	C0603C471K5RAC9045
3	C3C16, C3E1, C4E1	CAPT,D,100.000 UF, 10.000V,+/- 20%	VISHAY- SPRAGUE*	293D107X0010D2W
4	C3F1, C5D13, C5D15, C7D5	CAPC,X7R,0603,0.010 UF, 50.000V,+/- 10%	MURATA ELEC. NORTH AMERICA	GRM39X7R103K050AJ
1	C3G3	CAPT,B,10.000 UF, 16.000V,+/- 20%	KEMET	T491B106M016AS7454
2	C3G4, C5H1	CAPA,1500.000 UF,10X20, 6.300V,+/- 20%, T>	SANYO VIDEO COMPONENTS*	6MV1500WX
1	C3H1	CAPT,D,10.000 UF, 25.000V,+/- 10%	VISHAY- SPRAGUE	293D106X9025D2T
6	C3H3, C4F1, C6A8, C6F3, C7F1, C9A5	CAPA,220.000 UF, 8X13, 25.000V,+/- 20%, RD>	UNITED/NIPPON CHEMICON	SME25VB221M8X11FT
3	C4A2, C4H4, C4H5	CAPC,X5R,1206,22.000 UF, 6.300V,+/- 20%	MURATA ELEC. NORTH AMERICA	GRM31CR60J226MA
1	C4A3	CAPC,X7R,0603,1000.000 PF, 50.000V,+/- 5>	MURATA ELEC. NORTH AMERICA	GRM39X7R102J050AJ
5	C4D4, C4D6, C4D7, C5F2, C6F1	CAPT,E/X,150.000 UF, 10.000V,+/- 20%	KEMET	T491X157M010AS7454
7	C4G18, C4H1, C4H6, C5C2, C5F1, C5G9, C7G1	CAPC,X5R,1206,4.700 UF, 10.000V,+/- 10%	TDK CORPORATION OF AMERICA	C3216X5R1A475KT009N
4	C4G19, C6G17, C7G12, C7G13	CAPA,470.000 UF, 6X11,10.000V,+/- 20%, TH>	NICHICON CORPORATION	UVR1A471MEA
5	C4P1, C5D6, C5D10, C5E2, C5E4	CAPC,X7R,1206,10.00 uF, 6.300V,+/- 10%	TDK CORPORATION OF AMERICA	C3216X7R0J106KTB08N
4	C5A4, C5A5, C5A6, C5A7	CAPC,X7R,0402,220.000 PF, 50.000V,+/- 10>	TDK CORPORATION OF AMERICA	C1005X7R1H221KT009A
2	C5B3, C5B5	CAPC,C0G,0603,33.000 PF, 50.000V,+/- 5%	TDK CORPORATION OF AMERICA	C1608C0G1H330JT009A
7	C5B6, C5B8, C6B8, C6B9, C7U2, C7U3, C8B3	CAPC,X7R,0603,0.010 UF, 50.000V,+/- 5%	MURATA ELEC. NORTH AMERICA	GRM39X7R103J050AJ

Table 22. Bill of Materials (Sheet 4 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
2	C5B9, C6B10	CAPC,X7R,0603,0.150 UF, 16.000V,+/- 10%	TDK CORPORATION OF AMERICA	C1608X7R1C154KT009T
12	C5C1, C6C1, C7B9, C7B11, C7B12, C7C1, C7C2, C9B3, C9B5, C9B7, C9C1, C9C2	CAPC,Y5V,1210,10.000 UF, 25.000V,+80/-20>	TDK CORPORATION OF AMERICA	C3225Y5V1E106ZT009N
2	C5D2, C5D5	CAPT,D,47.000 UF, 16.000V,+/- 20%	VISHAY- SPRAGUE	293D476X0016D2W
2	C5D3, C5D4	CAPS,TA-P,V,220.000 uF, 4.000V,+/- 20%	KEMET	T520V227M004AS
1	C5H2	CAPC,X7R,0603,4700.000 PF, 50.000V,+/- 2>	TDK CORPORATION OF AMERICA	C1608X7R1H472MT009 N
6	C6A1, C6A2, C6A3, C6A5, C6A6, C6A7	CAPC,C0G,0603,3.300 PF,50.000V,+/- 0.25>	KEMET	C0603C339C5GAC9045
1	C6B7	CAPC,X7R,1210,1.000 UF, 25.000V,+/- 10%	MURATA ELEC. NORTH AMERICA	GRM32RR71E105KA01E
1	C6D1	CAPS,AL-P,E/X,270.000 uF, 2.000V,+/- 20%>	PANASONIC INDUSTRIAL	EEFUE0D271R
2	C6H1, C6H5	CAPA,2200.000 UF, 12X25,16.000V,+/- 20%, >	NICHICON CORPORATION	UPW1C222MHH1TO
17	C7A1, C7A2, C7A3, C7A4, C7A5, C7A6, C7A7, C7A8, C7A9, C7A10, C7A11, C7A12, C7A13, C7A14, C7A15, C8A3, C8A4	CAPC,X7R,0603, 220.000 PF, 50.000V,+/- 10>	KEMET	C0603C221K5RAC9045
2	C7B1, C8B2	CAPC,X5R,1206,3.300 UF, 10.000V,+/- 10%	KEMET	C1206C335K8PAC
2	C7B10, C8B5	CAPC,X7R,0603,0.022 UF, 25.000V,+/- 10%	MURATA ELEC. NORTH AMERICA	GRM39X7R233K025AJ
1	C7B2	CAPC,X7R,0603,1500.000 PF, 50.000V,+/- 1>	MURATA ELEC. NORTH AMERICA	GRM39X7R152K050AJ
4	C7C3, C7C4, C8C1, C8C2	CAPS,AL-P,D,220.000 uF, 2.500V,+/- 20%	PANASONIC INDUSTRIAL	EEFUD0E221XR
1	C7D2	CAPS,TA-P,V,150.000 uF, 4.000V,+/- 20%	SANYO VIDEO COMPONENTS	4TPC150MA2
1	C7D4	CAPC,X5R,1206,10.000 UF, 6.300V,+/- 20%	TDK CORPORATION OF AMERICA	C3216X7R0J106MT0S9N
1	C8B1	CAPC,X5R,1812,100.000 UF, 6.300V,+/- 20%>	MURATA ELEC. NORTH AMERICA	GRM43-2X5R107M6.3K
2	C9D1, C9D2	CAPC,X7R,1206,1.000 UF, 16.000V,+/- 10%	TDK CORPORATION OF AMERICA	C3216X7R1C105K0S9N
1	CP6A1	CAPC,X7R,1206,470.000 PF, 50.000V,+/- 20>	KEMET	C1632C471M5RAC9045
2	CR1F1, CR1G1	IC,DS,DIO,SOT-23,GP	SEMICONDUCTOR COMPONENTS INDUSTRIES LLC*	BAV99LT1
1	CR1G2	LED,SM,GRN/YEL,V,2,RC,2	STANLEY ELECTRIC SALES OF AMERICA*	AYPG1204W-170-TR

Table 22. Bill of Materials (Sheet 5 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
5	CR2G1, CR6H1, CR7B1, CR8B1, CR8B2	IC,DS,DIO,SOT-23,SHTKY	I T T SEMICONDUCTOR*	BAT54C
7	CR2J1, CR2J2, CR2J3, CR2J4, CR2J5, CR2J6, CR3D2	LED,SM,GRN,V,1,RC,1	STANLEY ELECTRIC SALES OF AMERICA	PG1112H-TR
7	CR3D1, CR7J1, CR8F1, CR8F2, CR8F3, CR8F4, CR8F5	LED,SM,AMBER,V,1,RC,1	STANLEY ELECTRIC SALES OF AMERICA	AA1112H-TR
3	CR4C1, CR4D1, CR4D2	IC,DS,DIO,SOT-23,GP	SEMICONDUCTOR COMPONENTS INDUSTRIES LLC	MMBD7000LT1
2	CR5B1, CR6B2	IC,DS,DIO,SOT323,BAT54WT1,ACC	ON SEMICONDUCTOR*	BAT54WT1
2	CR7B2, CR8B3	IC,DS,DIO,SOD123,MBR0540T1,ACC	ON SEMICONDUCTOR	MBR0540T1
2	DS1J1, DS1J2	LED DISP,7,1,8.00,MM,RED,THM	STANLEY ELECTRIC SALES OF AMERICA	NAR131S-C
2	FB3B1, FB3C1	FER-BEAD,1206,300.0 OHM,250.0 MA,± 25% >	KOA SPEER ELECTRONICS*	MCB1206FTED301P
10	FB5A1, FB5A2, FB5A3, FB5A4, FB5A5, FB5A6, FB9A1, FB9A3, FB9A4,FB9A5	FER-BEAD,0603,600.0 OHM,200.0 MA,	TDK CORPORATION OF AMERICA	MMZ1608Y601BTA1N
3	FB6A1, FB6A2, FB6A3	FER-BEAD,0603,75.0 OHM,0.2 A,± 25%	MURATA ELEC. NORTH AMERICA	BLM18BB750SN1D
1	FB9A2	FER-BEAD,0805,30.0 OHM,3.0 A,± 25%	MURATA ELEC. NORTH AMERICA	BLM21P300SPT1
3	J1B1, J2B1, J2B2	CONN,CEDG,120P,PCI,VT,0.05, 093ST	FOXCONN ELECTRONICS, INC.	EH06011-GL-1
2	J1G1, J1G3	CONN,HDR,1 X 2,PLG,VT,0.1,093ST,KP PG >	FOXCONN ELECTRONICS, INC.	HF06021-P1
1	J1G2	CONN,HDR,2 X 3,PLG,VT,0.1,062ST,KP 2	WIESON ELECTRONIC*	2100C888-062
11	J1G4, J1J1, J2B3, J2C1, J2J1, J9C1, J9C2, J9C3, J9C4, J9D1, J9D2	CONN,HDR,1 X 3,PLG,VT,0.1,062ST,KP 0.23>	WIESON ELECTRONIC	2100C888-001
1	J1H1	CONN,HDR,1 X 3,PLG,VT,0.1,093ST,KP 0.23>	WIESON ELECTRONIC	2100C888-002
1	J1H3	CONN,HDR,2 X 5,PLG,VT,0.1,062ST,KP 10,P>	WIESON ELECTRONIC	2100C888-003
2	J1J2, J1J3	CONN,SWIT,TACTILE,VT,SPST,2,50 .0 mA,SMT>	E-SWITCH*	TL3304AF160QJ
1	J2A1	CONN,HDR,2 X 5,PLG,VT,0.1,062ST,KP 8	WIESON ELECTRONIC	2100C888-042

Table 22. Bill of Materials (Sheet 6 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
3	J2H1, J8E1, J9B1	CONN,HDR,1 X 3,PLG,VT,0.1,093ST,KP 1,SH>	FOXCONN ELECTRONICS, INC.	HF08030-P1
9	J2H2, J2H3, J3A1, J4C1, J4E1, J4E2, J4E3, J4E4, J4E5	CONN,HDR,1 X 2,PLG,VT,0.1,062ST,KP 0.23>	WIESON ELECTRONIC	2100C888-051
1	J3A2	CONN,HDR,1 X 4,SHD,VT,0.1,062ST,KP PG >	TYCO ELECTRONICS CORPORATION*	147050-2
1	J3B1	CONN,HDR,1 X 4,SHD,VT,0.1,062ST,KP PG >	TYCO ELECTRONICS CORPORATION	147050-1
1	J3B2	CONN,HDR,1 X 4,SHD,VT,0.1,062ST,KP PG >	TYCO ELECTRONICS CORPORATION	104450-3
1	J3C1	CONN,CEDG,124P,AGP,VT,1MM, 062ST	FOXCONN ELECTRONICS, INC.	EE06250
2	J3G1, J3G2	CONN,CEDG,184P,DIMM,VT,0.05,0 62ST	FOXCONN ELECTRONICS, INC.	AT09217-P1
1	J3H1	CONN,HDR,2 X 20,PLG,VT,0.1,062ST,KP 20,>	WIESON ELECTRONIC	2120C888-005
1	J3H2	CONN,HDR,2 X 5,PLG,VT,0.1,062ST,KP 2,PG>	WIESON ELECTRONIC	2100C888-045
1	J3H3	CONN,HDR,2 X 20,PLG,VT,0.1,062ST,KP 20,>	WIESON ELECTRONIC	2120C888-002
1	J3J1	CONN,HDR,2 X 17,PLG,VT,0.1,062ST,KP SHR>	TYCO ELECTRONICS CORPORATION	1364552-1
1	J4A1	CONN,MISC,30 P,LCD, RA,1MM, SMT,	JAE*	FI-X30S-HF
1	J5A1	CONN,MISC,13 P,AUDIO JACK,3-STACK	FOXCONN ELECTRONICS, INC.	JA33331-G05
1	J5C1	CONN,HDR,1X7,RA,1.25MM	MOLEX CONNECTOR CORPORATION*	53261-0790
4	J5C2, J5F1, J6C1, J6F1	CONN,MISC,2 P,HEADER,ANCHOR	FOXCONN ELECTRONICS, INC.	HB96030-DW
1	J6J5	CONN,HDR,2 X 10,PLG,VT,0.165,093ST,KP P>	MOLEX CONNECTOR CORPORATION	67120-2020
1	J7A1	CONN,I/ O,15P,DSUB,RA,.09,062ST,W/ HEXNUT>	FOXCONN ELECTRONICS, INC.	DZ11A31-5P9
1	J7A2	CONN,I/ O,25P,DSUB,RA,.109,093ST	FOXCONN ELECTRONICS, INC.	DM11351-PR1
1	J8A1	CONN,I/O, 9P, DSUB, RA,.109, 062ST	FOXCONN ELECTRONICS, INC.	DT10121-PR9
1	J9A1	CONN,I/O,12P,DIN,RA,0.1,093ST	FOXCONN ELECTRONICS, INC.	MH11061-PD5
1	J9A2	CONN,I/O,8P,USB,RA,.09,093ST	FOXCONN ELECTRONICS, INC.	UB11123-5D1
1	J9F1	CONN, ZIF R/A SKT SMT 28CKT	MOLEX CONNECTOR CORPORATION	524352891
1	J9G1	CONN,I/O,3P,DIN,RA,2.5MM,093ST	TYCO ELECTRONICS CORPORATION	1470606-1

Table 22. Bill of Materials (Sheet 7 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
1	JA6A1	CONN,MISC,28 P,RJ45/2XUSB,W MAGNETIC	FOXCONN ELECTRONICS, INC.	UB11123-L21
1	L4B1	INDCT,4.70 uH,30.000 mA,10.00%,0805	MURATA ELEC. NORTH AMERICA	LQG21N4R7K10T2
1	L4E1	INDCT,1.00 uH,500.000 mA,20.00%,1210	TDK CORPORATION OF AMERICA	NLFC322522T-1R0M
4	L5B1, L5B2, L8A1, L8A2	CHOKE,90.0 OHM 200.0MA, 0805,2 LINE	TDK CORPORATION OF AMERICA	ACM2012-900-2P-TL
2	L5C1, L6C1	INDCT,4.70 uH,3.90 A,20.00%,0.04000OHM,>	DALE ELECTRONICS, INC.*	IHLP2525CZRZ4R7M01
2	L5C2, L6D1	INDCT,0.10 uH,250.000 mA,10.00%,0805	TDK CORPORATION OF AMERICA	MLF2012DR10KTA1N
1	L5F1	INDCT,0.68 uH,150.000 mA,10.00%,0805	TDK CORPORATION OF AMERICA	MLF2012DR68KTA1N
1	L5H1	INDCT,4.00 uH,10.00 A,15.00%,TH	PULSE ENGINEERING*	PA0125
1	L5J1	INDCT,1.60 uH,8.00 A,20.00%,0.00400OHM,>	BI TECHNOLOGIES*	HM00-99521
2	L7B1, L8B1	INDCT,0.36 uH,17.00 A,20.00%,0.00110OHM>	PANASONIC INDUSTRIAL	ETQP4LR36WFC
1	LB9J1	ASSY,LBL,IFICS,HALFDOME		
1	LS2H1	AUDIO XDCR, 80OHM, 2400HZ, 85DB,THM,5V	DB PRODUCTS LTD*	SEE ENTRY FOR CHALLENG
2	Q1G1, Q4B2	IC,DS,PNP XSTR,SOT-23,MMBT3906LT	SEMICONDUCTOR COMPONENTS INDUSTRIES LLC	MMBT3906
3	Q1G2, Q1G3, Q1H1	IC,DS,FET N,SOT-23,MMBF170	DIODES INC/LITEON POWER SEMI*	BS870
4	Q2B1, Q2C1, Q2D1, Q2H4	IC,DS,NPN XSTR,SOT6,MBT3904	PHILIPS COMPONENTS*	PUMX1
2	Q2G1, Q4A2	IC,DS,FET N,SOT-23,BSS138	FAIRCHILD SEMICONDUCTOR CORP*	BSS138
9	Q2H3, Q2P1, Q2P2, Q2R1, Q3C1, Q3D1, Q3R1, Q3R2, Q4C1	IC,DS,NPN XSTR,SOT-23,SHERPA	PHILIPS COMPONENTS	PMBT3904
1	Q3H1	IC,LIN,DPAK,LM1117DTX,VREG	NATIONAL SEMICONDUCTOR*	LM1117DTX-ADJ
2	Q4A1, Q4H1	IC,DS,FET P,SOT-23,SI2307DS	SILICONIX*	SI2307DS
2	Q5C1, Q6C1	IC,DS,FET N,SO8,SI4966DY	SILICONIX	SI4966DY
2	Q5H1, Q5H2	IC,DS,FET N,DPAK,PHD55N03LT	PHILIPS SEMICONDUCTORS*	PHD55N03LT
1	Q6G1	IC,DS,FET N,DPAK,MTD3302	SEMICONDUCTOR COMPONENTS INDUSTRIES LLC	MTD3302T4
1	Q6G2	IC,DS,FET P,DPAK,STD10PF06	STMICRO ELECTRONICS*	STD10PF06
4	Q7B1, Q7B2, Q8B1, Q8B2	IC,DS,FET N,SO8,FDS7764A	FAIRCHILD SEMICONDUCTOR INC	FDS7764A

Table 22. Bill of Materials (Sheet 8 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
6	R1A1, R2A9, R2B6, R3A3, R3A26, R3A27	RES D,0402,10.00 kOHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1ETP103J
11	R1A2, R1A3, R1A6, R1A9, R1A10, R1A14, R1A15, R1B4, R2A1, R2B3,R7J10	RES D,0402,0.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73Z1ET
3	R1C1, R2C4, R3C9	RES D,0603,300.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD301J
20	R1D1, R1D2, R1H9, R3B3, R3B5, R3C1, R3H7, R3H8, R4B5, R4B10, R4B11, R4B12, R4B20, R4B21, R4B23, R4B27, R4B32, R4C13, R4C17, R7J7	RES D,0603,33.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD330J
6	R1E1, R1G11, R2D1, R2D2, R7J8, R7J9	RES D,0603,2700.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD272J
54	R1F2, R1F4, R1G6, R1J5, R2C2, R2C3, R2E2, R2H1, R2H6, R2H9, R2M2,R2M3, R2M5, R2M6, R3B2, R3C7, R3F16, R3F17, R3F19, R3G1, R3G2, R3H5,R3M1, R3M2, R3M7, R4B7, R4B8, R4C2, R4C12, R4C14, R4C15, R5A1, R5H3,R5P9, R6C4, R6H4, R6H8, R6H9, R7B3, R7E1, R7H4, R7N	RES D,0603,0.00 OHM,5.00%,1/16W	ROHM CORPORATION*	MCR03EZHJ000
35	R1G1, R1G5, R1G8, R1G10, R1H4, R1H7, R2F1, R2G2, R2G3, R2G8, R2G11,R2H2, R2H7, R3C5, R3F3, R3F4, R3F6, R3F8, R3F9, R4B25, R4B26, R4B30, R4B31, R4C16, R4C19, R4D1, R5D3, R5M1, R5M2, R6A1, R7A1, R7F3, R7J4,R9B4, R9B6	RES D,0603,10.00 kOHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD103J
30	R1G12, R1H2, R2G14, R2G16, R2H16, R2H23, R2J2, R3C8, R4B33, R4C4, R4C5, R4C6, R4E1, R4E2, R4E3, R4E4, R4E5, R4R2, R5J2, R6G1, R8B4, R8B5, R8B9, R9C2, R9C4, R9C6, R9C9, R9D1, R9D3, R9D6	RES D,0603,1.00 kOHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD102J

Table 22. Bill of Materials (Sheet 9 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
2	R1G13, R1G16	RES D,0603,1500.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD152J
6	R1G14, R1G15, R2G1, R2G5, R2G7, R5D4	RES D,0603,8200.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD822J
12	R1G2, R1J3, R2G4, R2G6, R2P7, R3D2, R6C3, R7F1, R8H2, R8H5, R8H7,R9B8	RES D,0603,4700.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD472J
9	R1G4, R3D5, R3E1, R3E4, R4A3, R4A4, R7P3, R7R1, R7R2	RES D,0603,2200.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD222J
7	R1H1, R1H3, R2J1, R2J4, R2J6, R3D1, R3D3	RES D,0603,220.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD221J
4	R1H10, R4H1, R7F2, R9B7	RES D,0603,15000.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD153J
7	R1H11, R2G9, R2H22, R2J3, R2J5, R2R4, R7J3	RES D,0603,330.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD331J
3	R1H6, R2G13, R6J5	RES D,0603,22000.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD223J
6	R1J2, R4B16, R4B17, R4B18, R8J2, R8J4	RES D,0603,100.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD101J
5	R1P1, R1P2, R2R7, R3R7, R3R8	RES D,0603,110.000OHM,1.00%,1/16W	PANASONIC INDUSTRIAL	ERJ3EKF1100V
3	R2A5, R3A6, R3A30	RES D,0402,4.70 kOHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1ETP472J
1	R2A6	RES D,0402,100.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1ETP101J
2	R2A7, R2A8	RES D,0402,33.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1ETP330J
3	R2B5, R3A21, R3A24	RES D,0402,2.20 kOHM,5.00%,1/16W	AVX CERAMICS CORP	CR05-222J-H
2	R2B8, R2B11	RES D,0402,47.00 kOHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1ETP473J
2	R2B9, R3A13	RES D,0402,1.00 kOHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1ETP102J
3	R2G10, R2G12, R3F11	RES D,0603,10.00 MOHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD106J
3	R2G15, R3A33, R4A1	RES D,0603,100000.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD104J
1	R2H11	RES D,0603,47.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD470J
8	R2H20, R5B6, R5H1, R5H4, R5M3, R6A5, R6B4, R8B1	RES D,0805,0.00 OHM,5.00%,1/10W	ROHM CORPORATION	MCR10EZHMJ000

Table 22. Bill of Materials (Sheet 10 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
1	R2H21	RES D,0603,1300.000OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC*	CRCW06031301FRT5
2	R2H24, R9A1	RES D,0603,150000.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD154J
2	R2M1, R3F14	RES D,0603,3300.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD332J
1	R2M4	RES D,0603,12400.000OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD1242F
4	R2P1, R3P2, R9F1, R9F3	RES D,0603,54.90 OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD54R9F
5	R2P2, R3P1, R5D1, R6D1, R9F5	RES D,0603,27.40 OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD27R4F
5	R2P3, R2P6, R2R6, R3R5, R3R6	RES D,0603,2.94 kOHM,1.00%,1/16W	AVX CERAMICS CORP	CR10-2941F-F
7	R2P4, R2P5, R2R1, R3H1, R3H2, R3R2, R3R3	RES D,0603,453.00 OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD4530F
6	R2R3, R3R4, R7T1, R7T2, R7U2, R7U4	RES D,0603,56.200OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD56R2F
1	R2R5	RES D,0603,150.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD151J
1	R3A14	RES D,0402,110.00 OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1ETP1100F
2	R3A17, R3A32	RES D,0402,20.00 kOHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1ETP203J
1	R3A18	RES D,0402,249.00 OHM,1.00%,1/16W	AVX CERAMICS CORP	CR05-2490F-H
1	R3A19	RES D,0402,220.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1ETP221J
2	R3A2, R3A15	RES D,0402,470.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1ETP471J
1	R3A28	RES D,0402,22.00 kOHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1ETP223J
1	R3A35	RES D,0402,1.00 kOHM,1.00%,1/16W	AVX CERAMICS CORP	CR05-1001F-H
1	R3A4	RES D,0402,100.00 kOHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1ETP104J
4	R3A5, R3A11, R3A20, R3A29	RES D,0402,10.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1ETP100J
1	R3B4	RES D,0603,475.000OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD4750F
8	R3D4, R3E6, R3E7, R4C7, R4C8, R4M1, R5D6, R5M4	RES D,0603,100000.000OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD1003F
2	R3E2, R3E3	RES D,0603,8.2KOHM,1.00%,1/16W	KOA SPEER ELECTRONICS, INC.	RK73H1JTDD8201F

Table 22. Bill of Materials (Sheet 11 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
1	R3E5	RES D,0603,20.000OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD20R0F
9	R3E8, R4B2, R4B4, R5P10, R5R4, R6E1, R6R1, R6R5, R7H5	RES D,0603,100.000OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06031000FRT5
3	R3E9, R9F2, R9F4	RES D,0603,22.60 OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD22R6F
4	R3F1, R5D7, R5J3, R7C3	RES D,0603,1000.000OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06031001FRT5
16	R3F10, R4U1, R4U2, R4U3, R4U4, R4U5, R5U1, R5U2, R5U3, R5U4, R5U5,R5U6, R5U7, R5U8, R5U9, R6U1	RES D,0603,56.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD560J
1	R3F12	RES D,0603,48.70 OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW060348R7FRT5
14	R3F13, R3F15, R4B9, R4B13, R4B19, R4B22, R4B24, R4B28, R4R1, R5P6,R5R2, R6H1, R6H2, R7J1	RES D,0603,49.900OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW060349R9FRT5
1	R3H3	RES D,0603,5.11 kOHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD5111F
1	R3H4	RES D,0603,1.02 kOHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06031021FRT5
2	R3M10, R5P1	RES D,0603,137.000OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06031370FRT5
2	R3M3, R8B6	RES D,0603,5.36 kOHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06035361FRT5
1	R3M4	RES D,0603,10200.000OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD1022F
2	R3M5, R3M9	RES D,0603,2.700OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD2R7J
1	R3M6	RES D,0603,200.000OHM,1.00%,1/16W	PANASONIC INDUSTRIAL	ERJ3EKF2000A
1	R3M8	RES D,0603,240000.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD244J
4	R4A2, R4A7, R5C1, R5C3	RES D,2010,10.00 mOHM,1.00%,1/2W	VISHAY- DALE ELECTRONICS INC	WSL2010R010FR86
1	R4A5	RES D,0603,1000000.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD105J
1	R4B1	RES D,0603,124.000OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06031240FRT5

Table 22. Bill of Materials (Sheet 12 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
22	R4C3, R4F1, R4F2, R4F3, R4F4, R4F5, R4F6, R5F4, R5F5, R5F6, R5F7,R6F3, R6F4, R6F5, R6F6, R6F7, R6F8, R6H3, R6H7, R7F4, R7F5, R7G3	RES D,0603,10.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD100J
1	R4M2	RES D,0603,1.69 kOHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06031691FRT5
1	R4M3	RES D,0603,10000.000OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD1002F
1	R4M4	RES D,0603,66.50 OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW060366R5FRT5
3	R4M5, R5M8, R7C2	RES D,0603,2000.000OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD2001F
2	R4P1, R5P2	RES D,0603,301.000OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06033010FRT5
1	R5B1	RES D,0603,562.000OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD5620F
1	R5B2	RES D,0603,619.00 OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD6190F
7	R5B3, R7B1, R7B2, R7B7, R8B2, R8B12, R9B2	RES D,2512,2.00 mOHM,5.00%,1W,METFLM	VISHAY- DALE ELECTRONICS INC	WSL2512R002JR86
2	R5B4, R6B3	RES D,2512,0.00 OHM,5.00%,1W	ROHM CORPORATION	MCR100JZHMJ000
2	R5D2, R5J1	RES D,0603,1500.000OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06031501FRT5
1	R5D5	RES D,0603,40.200OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD40R2F
2	R5F1, R6F2	RES D,0603,604.000OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06036040FRT5
6	R5F2, R5P4, R6D3, R6F1, R7U3, R7U5	RES D,0603,150.000OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06031500FRT5
3	R5F3, R5N1, R6C5	RES D,0603,1.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD1R0J
2	R5H2, R5J5	RES D,0805,2.200OHM,5.00%,1/10W	ROHM CORPORATION	MCR10#ZH$2R2
1	R5M5	RES D,0603,6.65 kOHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD6651F
1	R5M6	RES D,0603,43.20 OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW060343R2FRT5
1	R5M7	RES D,0603,3.32 kOHM,1.00%,1/16W	PANASONIC INDUSTRIAL	ERJ3EKF3321A
1	R5R3	RES D,0603,37.40 OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW060337R4FRT5
2	R5R6, R5R7	RES D,0603,60.40 OHM,1.00%,1/16W	PANASONIC INDUSTRIAL	ERJ3EKF60R4A

Table 22. Bill of Materials (Sheet 13 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
3	R6A2, R6A3, R6A4	RES D,0603,75.000OHM,1.00%,1/16W	PANASONIC INDUSTRIAL	ERJ3EKF75R0Z
3	R6C1, R6C2, R9F7	RES D,0603,39.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD390J
1	R6R2	RES D,0603,68.10 OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD68R1F
1	R6R3	RES D,0603,287.00 OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06032870FRT5
1	R7B4	RES D,0603,620.00 kOHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD6203F
1	R7B5	RES D,0603,324.000OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06033240FRT5
2	R7B6, R8B10	RES D,0603,10.00 OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW060310R0FRT5
1	R7U1	RES D,0603,487.000OHM,1.00%,1/16W	PANASONIC INDUSTRIAL	ERJ3EKF4870V
1	R7U6	RES D,0603,130.000OHM,1.00%,1/16W	VISHAY- DALE ELECTRONICS INC	CRCW06031300FRT5
1	R8B11	RES D,0603,14.00 kOHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD1402F
2	R8B3, R8B7	RES D,0603,300000.000OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD304J
1	R8B8	RES D,0603,23700.000OHM,1.00%,1/16W	KOA SPEER ELECTRONICS	RK73H1JTDD2372F
1	R9F6	RES D,0603,680.00 OHM,5.00%,1/16W	KOA SPEER ELECTRONICS	RM73B1JTDD681J
2	RP1B1, RP2B1	RES A,1206,8.20 kOHM,5.00%,1/4W,RPAK-SM>	ROHM CORPORATION	MNR14$OABJ822
2	RP1C1, RP3F1	RES A,1206,0.00 OHM,5.00%,1/4W,RPAK,4,8>	ROHM CORPORATION	MNR14E0ABJ000
8	RP1C2, RP1D1, RP2C1, RP2C2, RP2D1, RP2E1, RP7A3, RP9A1	RES A,1206,2.70 kOHM,5.00%,1/4W,RPAK-SM>	ROHM CORPORATION	MNR14$OABJ272
1	RP1H1	RES A,1206,4.70 kOHM,5.00%,1/4W,RPAK-SM>	ROHM CORPORATION	MNR14$OABJ472
4	RP1H2, RP1J1, RP1J2, RP1J3	RES A,1206,240.00 OHM,5.00%,1/4W,RPAK-S>	ROHM CORPORATION	MNR14$OABJ241
4	RP2A1, RP2A2, RP2A3, RP2A4	RES A,1206,6.80 kOHM,5.00%,1/4W,RPAK-SM>	ROHM CORPORATION	MNR14$OABJ682
7	RP3B1, RP3B2, RP3B3, RP3C1, RP7A1, RP7A2, RP7A4	RES A,1206,33.00 OHM,5.00%,1/4W,RPAK-SM>	ROHM CORPORATION	MNR14$OABJ330

Table 22. Bill of Materials (Sheet 14 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
18	RP4F1, RP4F2, RP4F3, RP4F4, RP4F5, RP5F1, RP5F2, RP5F3, RP5F4,RP5F5, RP6F1, RP6F2, RP6F3, RP6F4, RP6F5, RP7F1, RP7F2, RP7F3	RES A,1206,10.00 OHM,5.00%,1/4W,RPAK,4,>	ROHM CORPORATION	MNR14$OABJ100
27	RP4G1, RP4G2, RP4G3, RP4G4, RP4G5, RP4G6, RP4G7, RP4G8, RP5G1,RP5G2, RP5G3, RP5G4, RP5G5, RP5G6, RP5U1, RP5U2, RP6G1, RP6G2,RP6G3, RP6G4, RP6G5, RP6G6, RP6G7, RP7G1, RP7G2, RP7G3, RP7G4	RES A,1206,56.000OHM 5.00%,1/4W,RPAK-SM>	ROHM CORPORATION	MNR14$0ABJ560
3	RP5J1, RP7J2, RP7J3	RES A,1206,1.00 kOHM,5.00%,1/4W,RPAK-SM>	ROHM CORPORATION	MNR14$OABJ102
4	RP7H1, RP7H2, RP7J1, RP8A1	RES A,1206,10.00 kOHM,5.00%,1/4W,RPAK-S>	ROHM CORPORATION	MNR14$OABJ103
1	RP8J1	RES A,1206,2200.000OHM 5.00%,1/4W,RPAK->	ROHM CORPORATION	MNR14$OABJ222
4	RT2H1, RT6B1, RT8A1, RT9A1	POLYSWITCH,SMT,1.500A	RAYCHEM CORPORATION*	MINISMDC150-2
1	RT7A1	POLYSWITCH,SMT,1.100A	RAYCHEM CORPORATION	MINISMDC110-2
1	U1B1	IC,LOG, GATES,SOIC,74LVC00A,NAND	PHILIPS COMPONENTS	74LVC00AD
1	U1D1	IC,EEPROM,PR,SOIC,1MHZ,64X16	ATMEL*	AT93C66-10SI-2.7
1	U1H1	IC,FLASH,82802AB,32,PLCC,4 MBIT	INTEL CORP	N82802AB SB48
1	U1J1	IC,PLD,PRGMD,44 TQFP,EPM7032AET	ALTERA CORP*	EPM7032AETC44-10
1	U2A1	IC,LIN,AMP,8,MSOP,LM4871,OP	NATIONAL SEMICONDUCTOR	LM4871
1	U2A2	IC,VLSI,AUDIO,AD1981AJ,TQFP,48	ANALOG DEVICES*	AD1981AJST
1	U2B1	IC,LIN,DPAK,78M05,VREG	NATIONAL SEMICONDUCTOR	LM78M05CDT
3	U2B2, U2H1, U9B1	IC,DS,FET N,SO8,SI4501	SILICONIX	SI4501DY
1	U2F1	ASSY,IC,CHIPSETS,A, N/A, 82801DB,A,1,421,>	INTEL CORP	FW82801DB QC97
1	U2J2	IC,LIN,DDPAK,EZ1086-3.3,VREG	SEMTECH CORPORTION*	EZ1086CM-3.3 TR
1	U3A1	IC,LIN,OP AMP,SOIC,LF353	NATIONAL SEMICONDUCTOR	LF353MX

Table 22. Bill of Materials (Sheet 15 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
1	U3B1	IC,CLK_DRVR,56 SSOP,W320-04H,BUF	CYPRESS ELECTRONICS*	W320-04H
1	U3E1	IC,LIN,SOIC,317,VREG	NATIONAL SEMICONDUCTOR	LM317LMX
1	U3H1	IC,LIN,TO220,LM1084IS-AD,VREG	NATIONAL SEMICONDUCTOR	LM1084IS-ADJ
1	U4C1	IC,CLK_GEN,8,SOIC,ICS91718,GNRTR	INTEGRATED CIRCUIT SYSTEMS (ICS)*	ICS91718
1	U4C2	IC,LOG,Q-SWITCH,TSSOP,SN74CBT3306,BUS	TEXAS INSTRUMENT*	SN74CBT3306PWR
1	U4C3	CONN,MISC,VERT P,SMA,CONN,SMA,J	TYCO ELECTRONICS CORPORATION	221789-1
1	U4D1	IC,LOG,Q-SWITCH,TSSOP,SN74CBTD338,BUS	TI*	SN74CBTD3384PWR
1	U4H1	IC,DS,FET N,DPAK,NTD4302T4	ON SEMICONDUCTOR	NTD4302T4
1	U5B1	ASSY,IC,CHIPSETS,A, N/A, DA82562EM,A,2,48	INTEL CORP	DA 82562 EM
1	U5B2	IC,LOG, GATES,SOT,AHC1G08,AND	TEXAS INSTRUMENT	SN74AHC1G08DBVR
1	U5E1	ASSY,IC,CHIPSETS,RG, N/A, 82855 GME,A,2,732>	INTEL CORP	RG82855 GME QE27
1	U5J1	IC,LIN,CONT,0,SO8,TPPM0115DR, PSP	TEXAS INSTRUMENTS	TPPM0115DR
3	U6B1, U6B2, U7J1	IC,LOG, GATES,SOT(LG),74AHCT1G08,AND	TEXAS INSTRUMENT	SN74AHCT1G08DBVR
1	U6B3	IC,LIN,SSOP,ISL6225CA-T,VREG	INTERSIL INC*	ISL6225CA-T
1	U6H1	IC,LIN,OP AMP,SOIC,LM358	NATIONAL SEMICONDUCTOR	LM358MX
2	U7B1, U8B1	IC,LIN,DRVR,10,MSOP,ADP3415,FETDVR	ANALOG DEVICES	ADP3415KRM-REEL7
4	U7B2, U7C1, U8B2, U8C1	IC,DS,FET N,SO8,IRF7811ATR	INTERNATIONAL RECTIFIER*	IRF7811ATR
1	U7H1	IC,VLSI,SIO,LPC47M102S,REV.C,QFP,100	STANDARD MICROSYSTEMS CORP.*	LPC47M102S-MC
1	U7J2	IC,ASIC,GC4PHLPS,56 TSOP	PHILLIPS SEMICONDUCTORS	PCA9504A
1	U8A1	IC,LIN,INTF,RS232,GD75232,SSOP, RS232,0.>	TEXAS INSTRUMENTS	GD75232DBR
1	U8D1	CONN,SKT,479P,BGA,0.05,SMT,ZIF	FOXCONN ELECTRONICS, INC.	PZ47903-2741-01
1	U9D1	IC,LIN,MSOP,ADP3333,VREG	ANALOG DEVICES	ADP3333ARM-1.8
1	XBT1F1	BAT ACC,HOLDR,THM,CR2032	MEMORY PROTECTION DEVICES INC.*	BS-7

Table 22. Bill of Materials (Sheet 16 of 16)

Qty	Reference	Description	Manufacturer	Manufacturer P/N
1	XU1H1	CONN,SKT,32P,PLCC,0.05,SMT	TYCO ELECTRONICS CORPORATION	822475-1
1	XY2G1	RETAINER,HSG,MBD,INJ,POLY,NONE,PRIM	PLASTIC TECHNOLOGIES GROUP*	A52705-003
1	Y1A1	XTAL,HC49S,24.5760,MHZ,0.005%,SM	RALTRON*	630770-010
1	Y2G1	XTAL,CYL3X8,32.7680,KHZ,13,PF,0.002%,TH>	RALTRON	107930-002
1	Y3B1	XTAL,HC49S,14.3182,MHZ,20,PF,0.005%,SM	RALTRON	630770-003
1	Y5B1	XTAL,HC49S,25.0000,MHZ,20,PF,0.005%,SM	RALTRON	630770-011

Schematics B

This section provides the schematics for the Intel® Pentium® M Processor, Intel® 855GME Chipset and Intel® FW82801DB Development Kit.

REVISIONS							
REV	DESCRIPTION	DFT	DATE	CHK	DATE	APVD	DATE

PAGE #	COMPONENT/FUNCTION
1	COVER PAGE.
2	TABLES: BLOCK DIAGRAM
3	TABLES: RESET MAP
4	TABLES: CLOCK DISTRIBUTION
5	TABLES: GPIO/IDSEL MAPPING
6	TABLES: VOLTAGE DISTRIBUTION
7	CORE: CK_408 (MAIN CLOCK GENERATOR)
8	CORE: CPU CONNECTOR 1 OF 2
9	CORE: CPU CONNECTOR 2 OF 2
10	CORE: CPU PULL-UPS,PLL CIRCUITRY,TJPRO CONN
11-13	CORE: 855GME GMCH
14	CORE: 855GME CIRCUITRY
15	CORE: 855GME PLL, STRAPS, LVDS CLOCK GEN
16	CORE: DDR SERIES TERMINATION
17	CORE: DIMM CONNECTORS
18-19	CORE: DDR PARALLEL TERM (STROBES, CNTL)
20	CORE: DDR VTERM CAPS
21	CORE: AGP DIGITAL DISPLAY CONNECTOR
22	CORE: VGA CONNECTOR
23-24	ICH: 82801DB I/O CONTROLLER HUB
25	ICH: ICH PULL-UP/PULL-DOWNS
26	CORE: LVDS
27	ICH: IDE PRIMARY & SECONDARY
28	ICH: USB BACK PANEL CONNECTORS
29	ICH: USB FRONT PANEL VREG & OC#,
30-32	ICH: PCI SLOTS 3 - 1, SLOT1 SHARED WITH EVMC
33	ICH: PCI PULL-UPS
34	SMBUS ISOLATION
35	LAN: 82562EM
36	AUDIO: CODEC (AD1981A)
37	AUDIO: CODEC FILTERING CAPS
38	AUDIO: AUX-IN, CD-IN, LINE-IN: ATAPI HEADERS
39	AUDIO: MIC-IN
40	AUDIO: LINE-OUT
41	AUDIO: FRONT PANEL AUDIO HEADER
42	AUDIO: TRANSIENT CONTROL
43	AUDIO: ANALOG VREG
44	SIO: LPC47M102
45	SIO: FLOPPY
46	SIO: KEYBOARD & MOUSE PORTS (PS/2)
47	SIO: PARALLEL PORT
48	SIO: COM1 (DFM29)

PAGE #	COMPONENT/FUNCTION
49	FWH: MFG MODE AND RECOVERY JUMPERS
50	GLUE4
51	PC SPEAKER
52	FRONT PANEL HEADER
53	LABELS / MOUNTING HOLES
54	FAN: FAN HEADERS (3)
55	VREG: 2.5V MEMORY, STANDBY-MEMORY
56	VREG: 1.25V MEMORY VTT
57	VREG: ATX POWER CONNECTOR 2X10
58	VREG: BATTERY, PCI VAUX, USB_NCH & USB_PCH
59	VREG: USB BACK PANEL, PS/2
60	VREG: 1.5V STBY & 3.3V STBY
61	VREG: BULK DECOUPLING
62	VREG: 2.5V STR DECOUPLING
63	VREG: CORE 1.5V
64	VREG: CPU MAIN REGULATOR (CPU_CORE)
65	VREG: CPU DECOUPLING, CPU VREG DECOUPLING
66	VREG: 855GM CORE REGULATOR, VCCP REGULATOR
67	DEBUG: TITLE PAGE
68	DEBUG: ITP PORT AND PULL-UPS
69	MOON ISA RESISTORS
70	CPU STATUS LEDS
71	DEBUG: DIAGNOSTIC LEDS ,JUMPERS (H_VID)
72	DEBUG: PORT80 DECODER
73	DEBUG: HUBLINK PROBE, POC CIRCUIT, LED STATUS
74	DEBUG: DIAGNOSTIC JUMPERS (SMI, STPCLK), SMA CONNECTOR
75	REVISION HISTORY

855GME

CRB SCHEMATICS
2-DDR SDRAM, 8 LAYER, ATX

FAB D

PBA: C24895-400

POWER SYMBOLS USED:

VCC3
VCC
VCCP
+12V
-12V

NOTES:

1. RESISTORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED.
2. VCC = +5 VOLTS UNLESS OTHERWISE SPECIFIED.
3. VCC3 = +3.3 VOLTS UNLESS OTHERWISE SPECIFIED.
4. VCCP = +1.05 VOLTS UNLESS OTHERWISE SPECIFIED.
5. * SUFFIX INDICATES ACTIVE LOW SIGNAL.
6. THIS DOCUMENT ALSO EXISTS ON ELECTRONIC MEDIA.

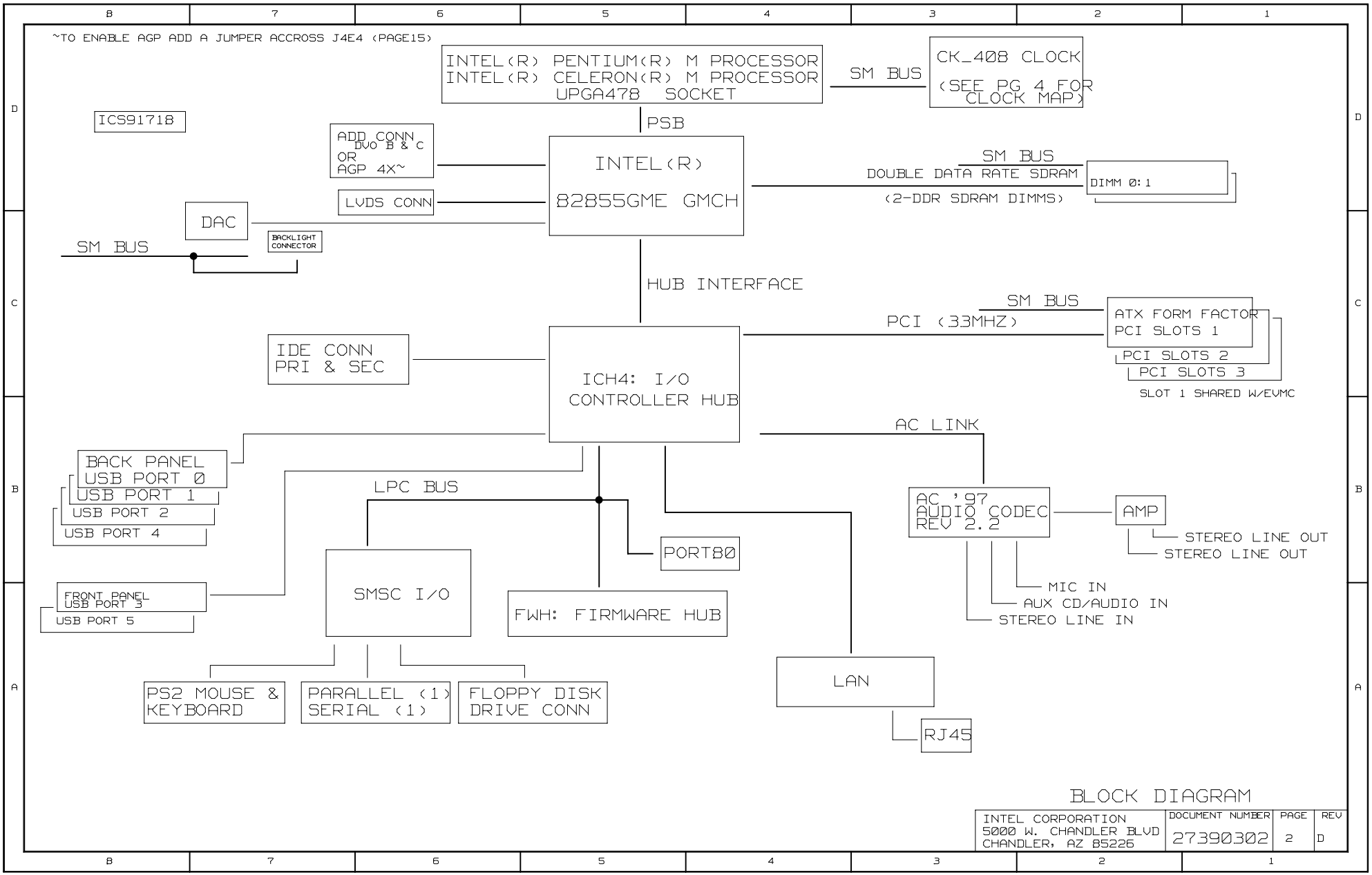
NOTES:

1. THIS SCHEMATIC DOCUMENTS THE GENERIC PRODUCT WITH ALL POSSIBLE CONFIGURATIONS. PLEASE REFER TO SPECIFIC PRODUCT PBA EPLs FOR ITEMS SHOWN AS OPTIONAL IN THE SCHEMATIC.
2. RESISTORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED.
3. VCC = +5V UNLESS OTHERWISE SPECIFIED.
4. * SUFFIX INDICATES ACTIVE LOW SIGNAL.
5. \I SUFFIX INDICATES SIGNAL EXITS HIERARCHICAL BLOCK.
6. THIS DOCUMENT ALSO EXISTS ON ELECTRONIC MEDIA.

INTEL(R) PENTIUM(R) M PROCESSOR
INTEL(R) 82855GME GMCH
INTEL(R) 82801DB I/O CONTROLLER HUB 4

INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226

DOCUMENT NUMBER	PAGE	REV
27390302	1/75	D



BLOCK DIAGRAM

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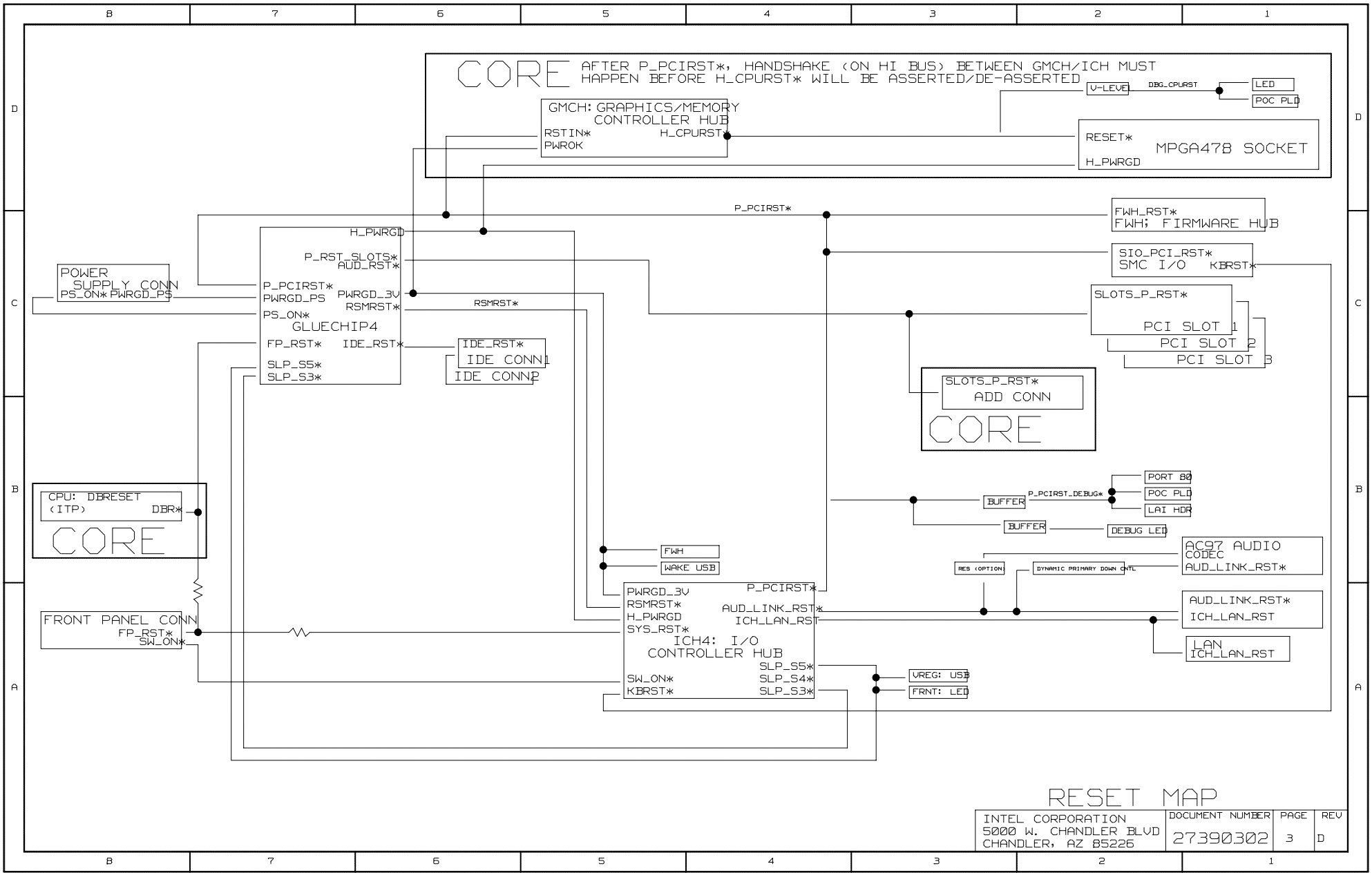
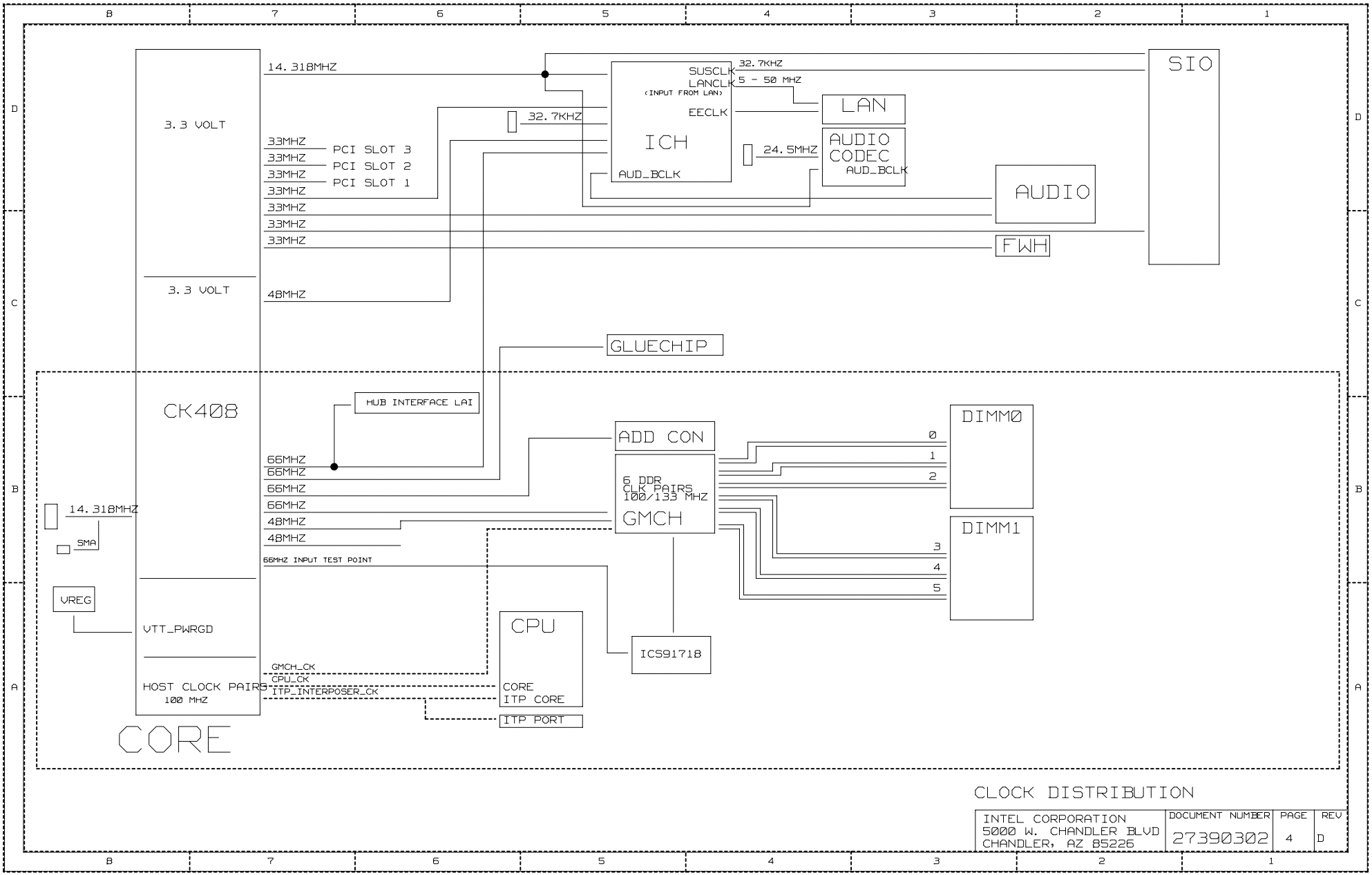


RESET MAP

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	3	D



CLOCK DISTRIBUTION

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER 27390302	PAGE 4	REV D

ICH4

	PIN NAME	PWR WELL	USAGE	DURING RESET	S3/S4/S5	INTERNAL PULL-UP	NOTES
ICH4	GPI(0)	CORE	P_REQA#	---	---		
	GPI(1)	CORE	P_REQ5#	---	---		
	GPI(2)	CORE	P_IRQE#	---	---		
	GPI(3)	CORE	P_IRQF#	---	---		
	GPI(4)	CORE	P_IRQG#	---	---		
	GPI(5)	CORE	P_IRQH#	---	---		
	GPI(6)	CORE	UNUSED	---	---		
	GPI(7)	CORE	UNUSED	---	---		
	GPI(8)	RESUME	UNUSED	---	---		
	GPI(11)	RESUME	SMB_ALERT#	---	---		
	GPI(12)	RESUME	LPC_SIO_SMI#	---	---		
	GPI(13)	RESUME	LPC_SIO_PME#	---	---		
	GPO(16)	CORE	P_GNTA#	HIGH	OFF	24K	
	GPO(17)	CORE	P_GNT5#	HIGH	OFF	24K	
	GPO(18)	CORE	UNUSED	HIGH	OFF		
	GPO(19)	CORE	LVDS_BKLTSEL0	HIGH	OFF		
	GPO(20)	CORE	LVDS_BKLTSEL1	HIGH	OFF		
	GPO(21)	CORE	ISA_GO_NOGO	HIGH	OFF		
	GPO(22)	CORE	UNUSED	HIGH-Z	OFF		
	GPO(23)	CORE	UNUSED	LOW	OFF		
	GPIO(24)	RESUME	UNUSED	LOW	DEFINED		
	GPIO(25)	RESUME	GPO_GRN_BLNK	HIGH	DEFINED		
	GPIO(27)	RESUME	GPO_YEL_BLNK	HIGH	DEFINED		
	GPIO(28)	RESUME	GPO_LAN_DISABLE	HIGH	DEFINED		
	GPIO(32)	CORE	UNUSED	HIGH	OFF		
	GPIO(33)	CORE	GPO_AUD_EN*	HIGH	OFF		
	GPIO(34)	CORE	UNUSED	HIGH	OFF		
	GPIO(35)	CORE	UNUSED	HIGH	OFF		
	GPIO(36)	CORE	UNUSED	HIGH	OFF		
	GPIO(37)	CORE	(BOARD1)	HIGH	OFF		
	GPIO(38)	CORE	(BOARD2)	HIGH	OFF		
	GPIO(39)	CORE	(BOARD3)	HIGH	OFF		
	GPIO(40)	CORE	(BOARD4)	HIGH	OFF		
	GPIO(41)	CORE	UNUSED	HIGH	OFF		
	GPIO(42)	CORE	UNUSED	HIGH	OFF		
	GPIO(43)	CORE	UNUSED	HIGH	OFF		
	RI*	RESUME					
	THERM*	CORE					
FWH	GPI4		CONFIG JUMPER	INPUT	DEFINED		CONFIG JUMPER
	GPI3		MANUF MODE	INPUT	DEFINED		MANUF MODE
	GPI2		HI/LOW BIOS CONFIG	INPUT	DEFINED		SPARE HI/LOW BIOS CONFIG STRAP
	GPI1		GPIO_DMA66_DETECT_SEC	INPUT	DEFINED		ATA66 CABLE DETECT - SECONDARY
	GPI0		GPIO_DMA66_DETECT_PRI	INPUT	DEFINED		ATA66 CABLE DETECT - PRIMARY
SIO	GPIO20		RESISTOR STRAP OPTION	INPUT	DEFINED		DESIGN FEATURE WITH RESISTOR STRAPPING
	GPIO21		RESISTOR STRAP OPTION	INPUT	DEFINED		DESIGN FEATURE WITH RESISTOR STRAPPING
	GP027/IOSMI*		IO_SMI*	INPUT	DEFINED		SENDS IO SMI REQUEST TO ICH2

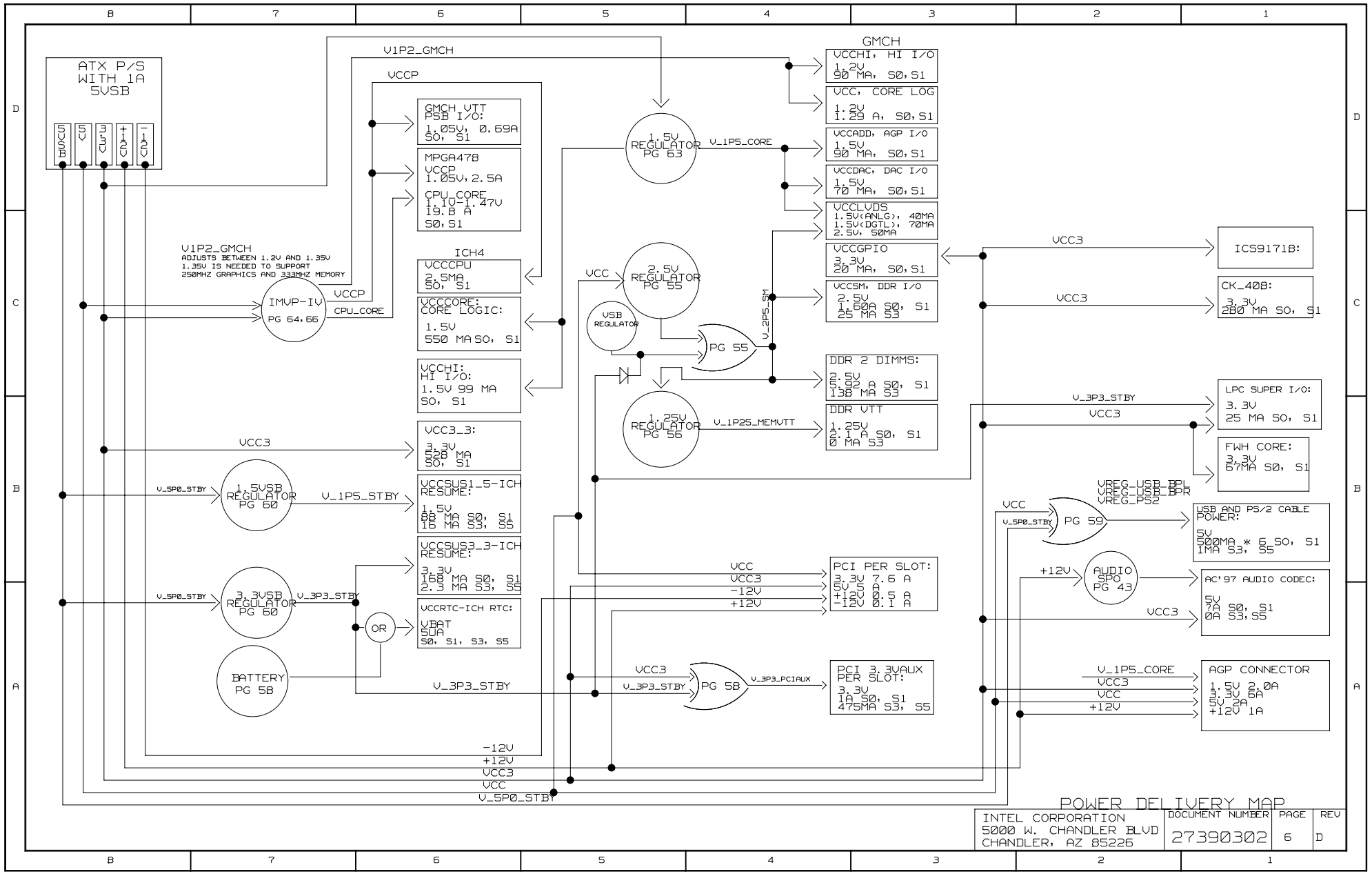
MULTI-PLEXED GPIO PINS ON SIO USED FOR SPECIFIC FUNCTIONS (NOT AS GPIO) ARE NOT IDENTIFIED HERE
UN-USED GPIO PINS ON SIO ARE NOT IDENTIFIED HERE

IRQ ROUTING TABLE

	AGP	SLOT1	SLOT2	SLOT3	AC97/ SMBUS	USB 2.0 #0	USB 2.0 #1	USB 2.0 #2	USB 2.0 #3	LAN
INT A	A			D			A			
INT B	B			C	A					
INT C				A					A	
INT D				B				A		
INT E		D	C							A
INT F		A	B							
INT G		B	A							
INT H		C	D			A				
REG /GNT		0	1	2						
IDSEL		16	17	18						24

GPIO, IRQ, IDSEL MAPS

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	5	D



POWER DELIVERY MAP

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
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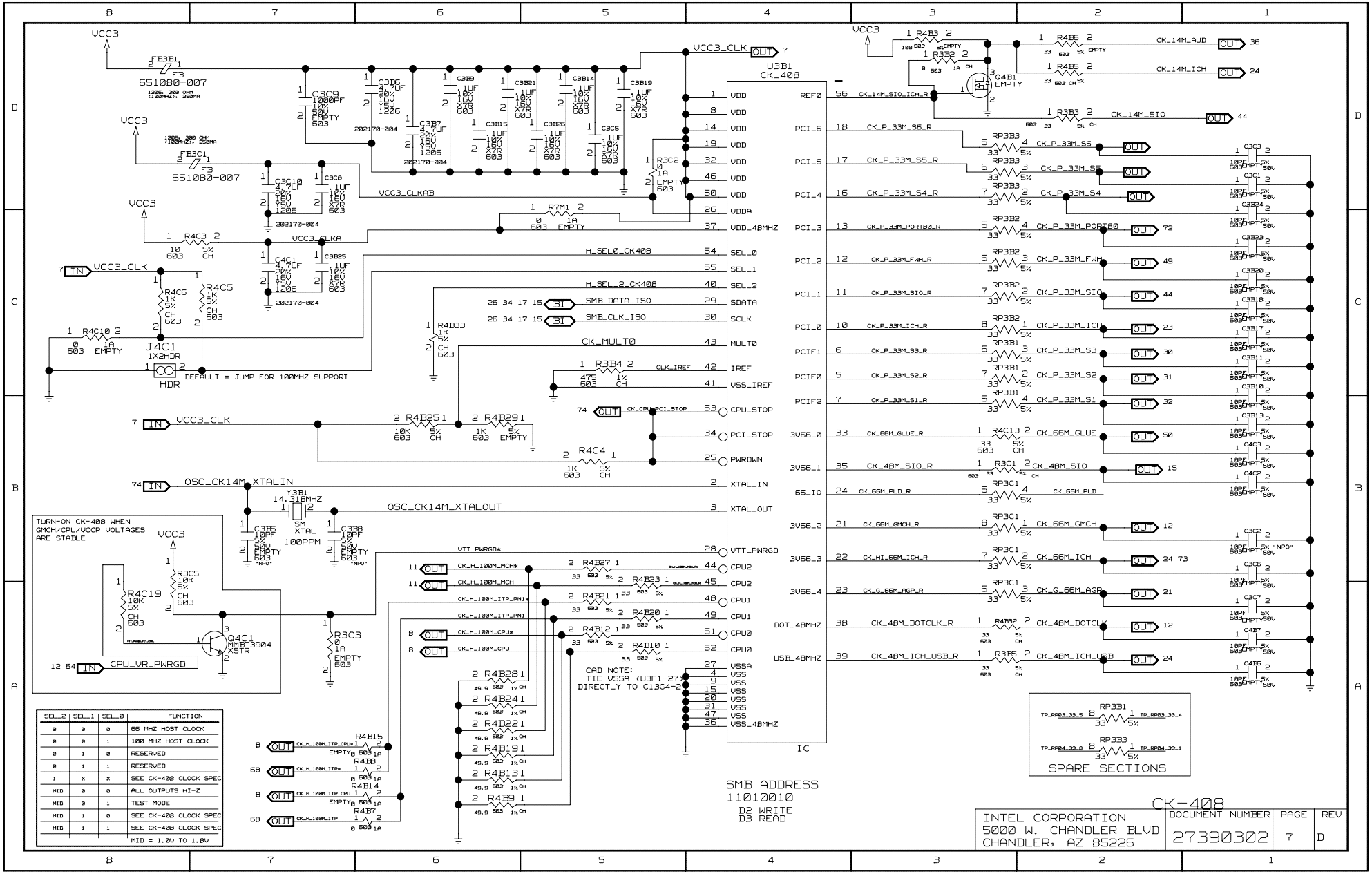
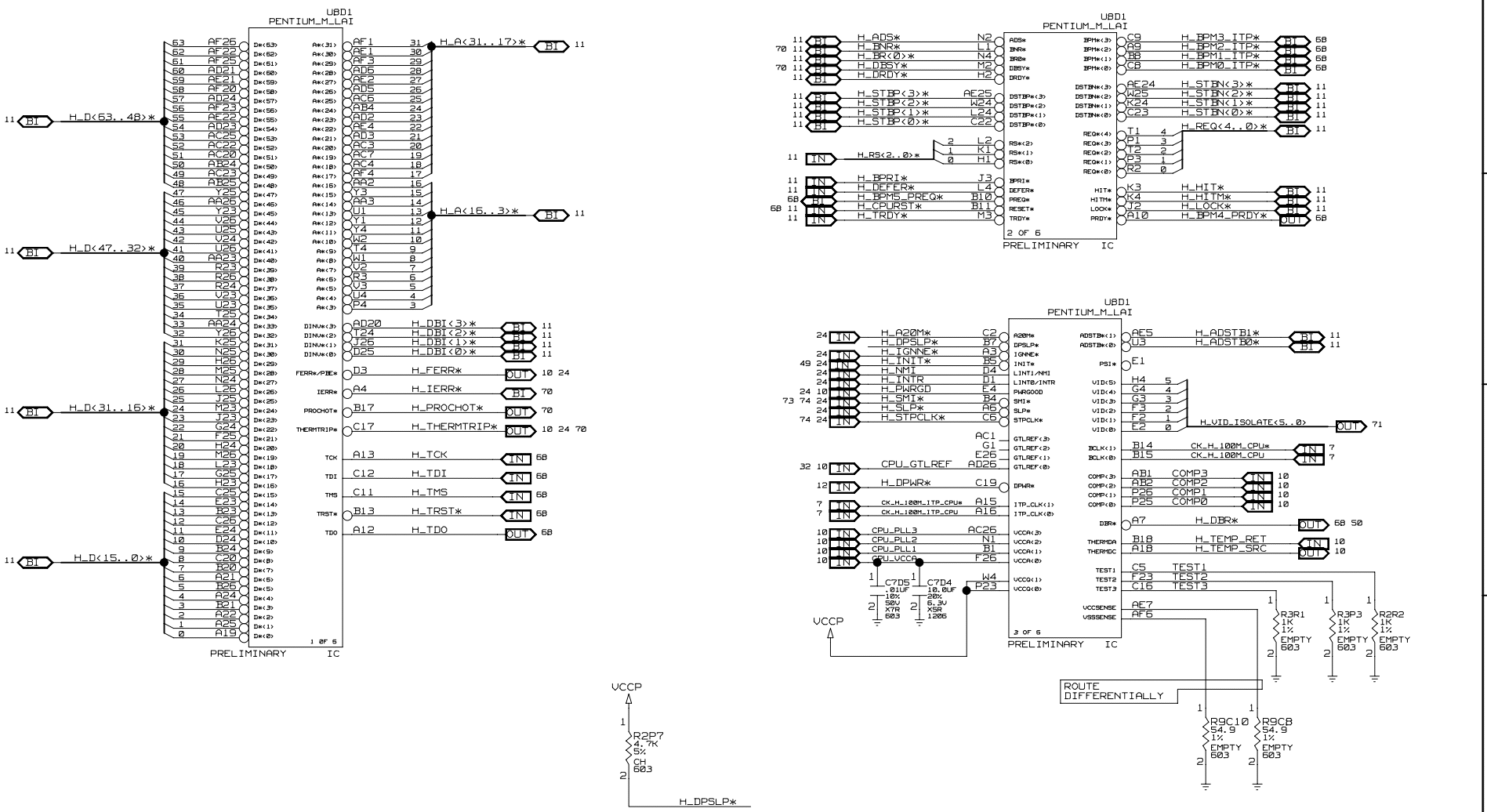


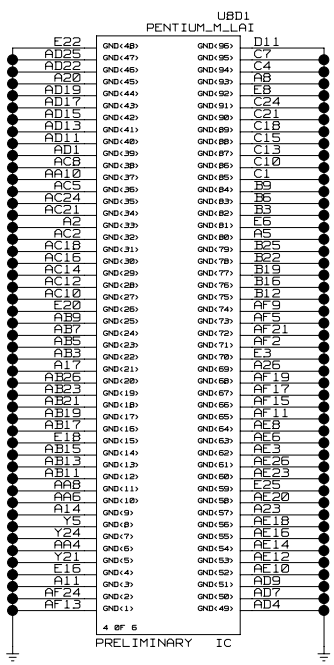
SEL_2	SEL_1	SEL_0	FUNCTION
0	0	0	66 MHZ HOST CLOCK
0	0	1	100 MHZ HOST CLOCK
0	1	0	RESERVED
0	1	1	RESERVED
1	X	X	SEE CK-408 CLOCK SPEC
MID	0	0	ALL OUTPUTS HI-Z
MID	0	1	TEST MODE
MID	1	0	SEE CK-408 CLOCK SPEC
MID	1	1	SEE CK-408 CLOCK SPEC

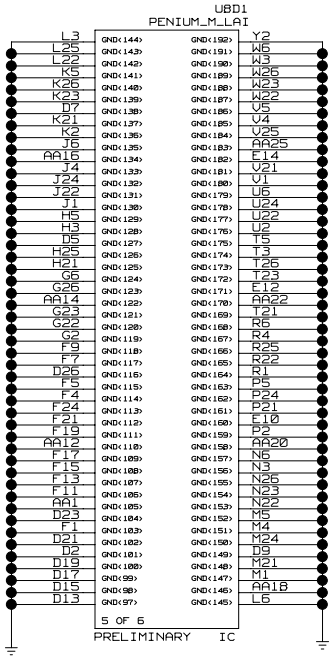
MID = 1.0V TO 1.8V

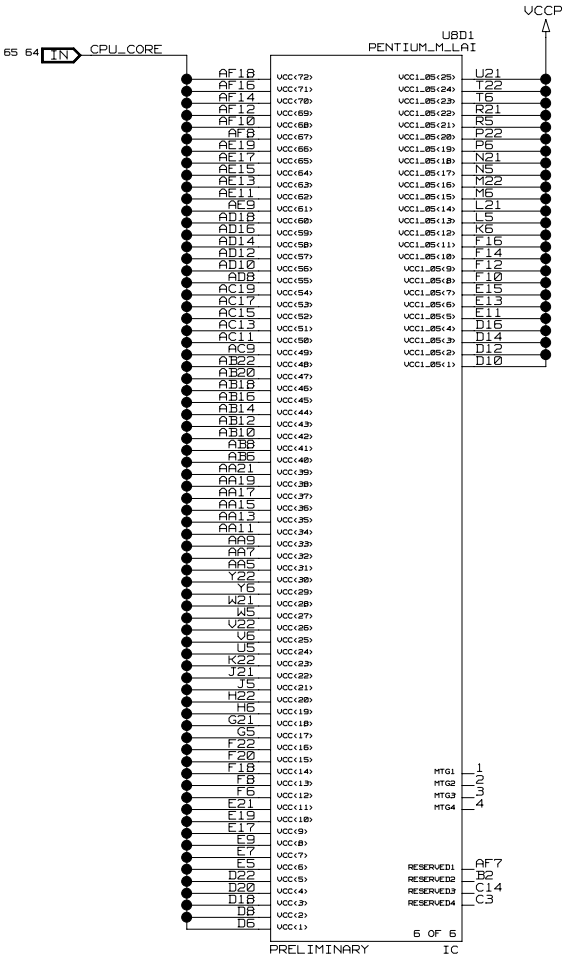


CPU 1 OF 2

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER 27390302	PAGE 8	REV D

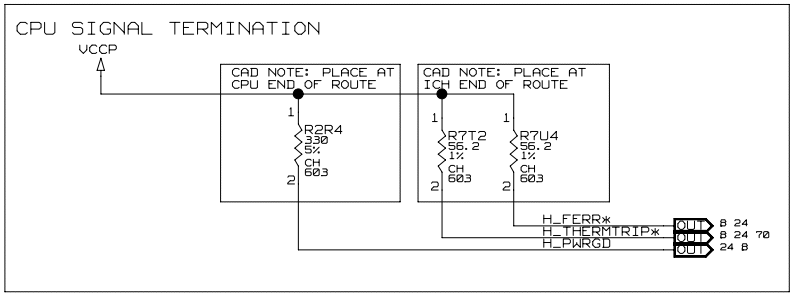


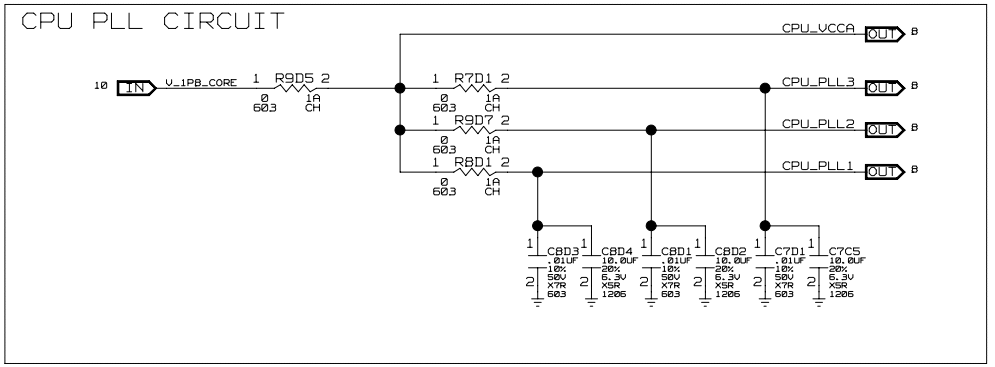


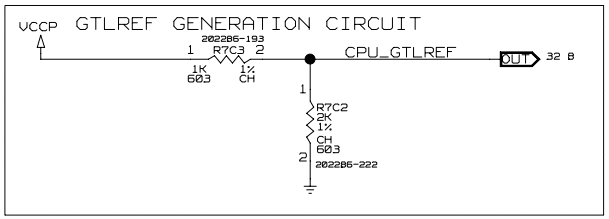


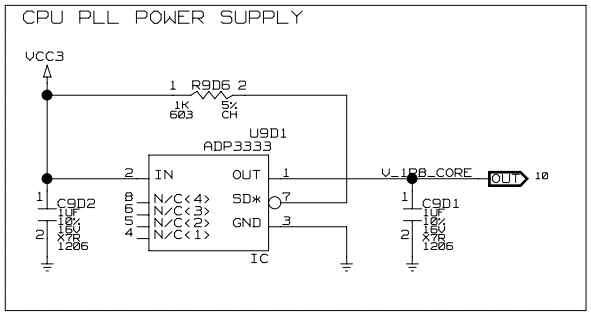
CPU 2 OF 2

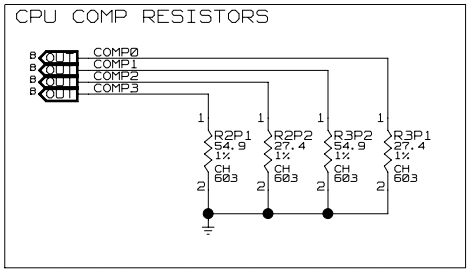
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER 27390302	PAGE 9	REV D

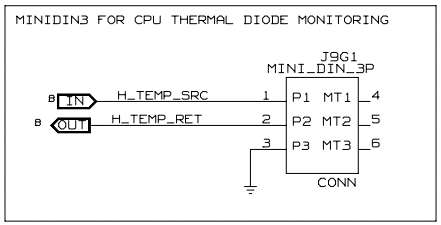






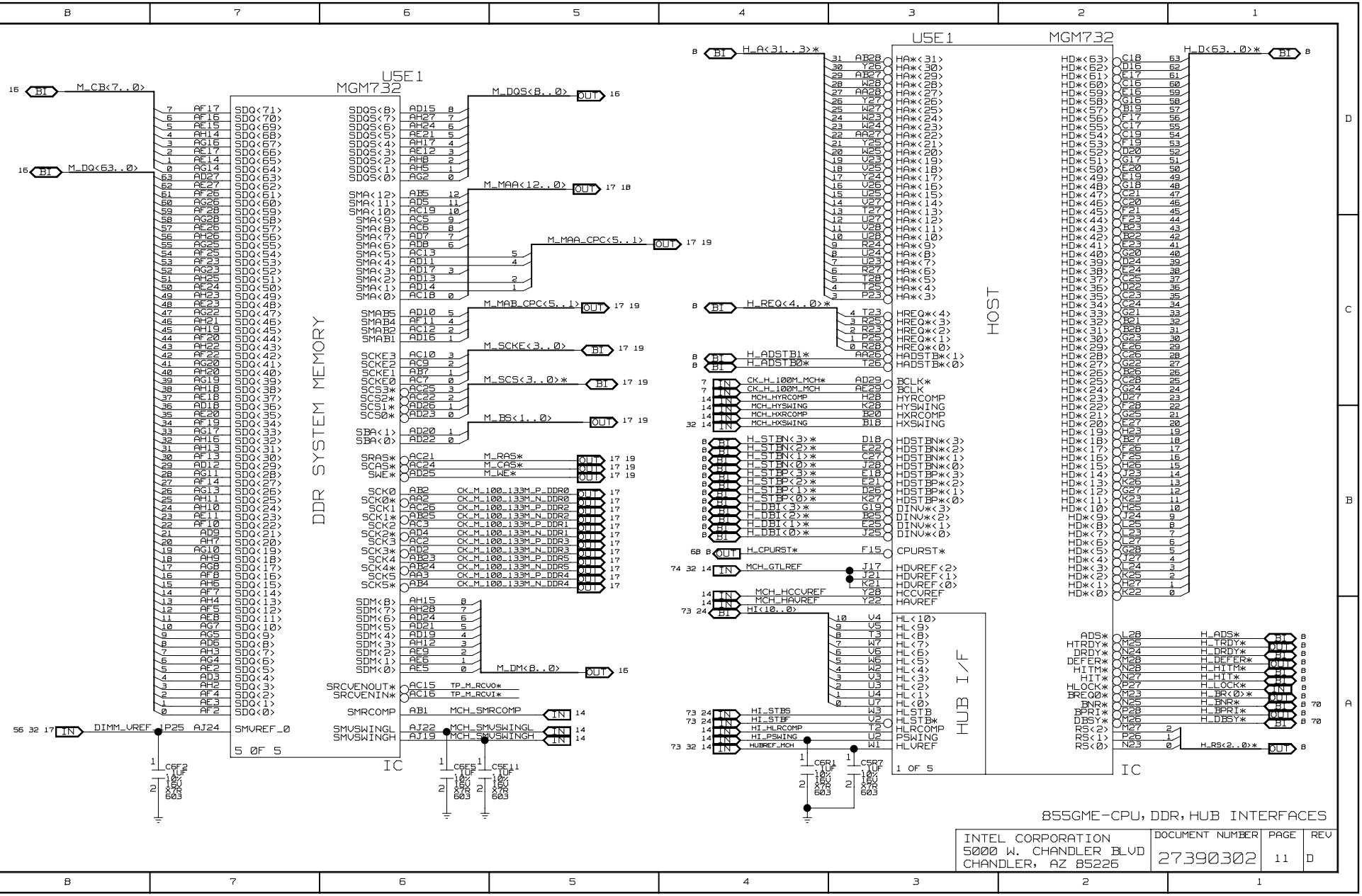


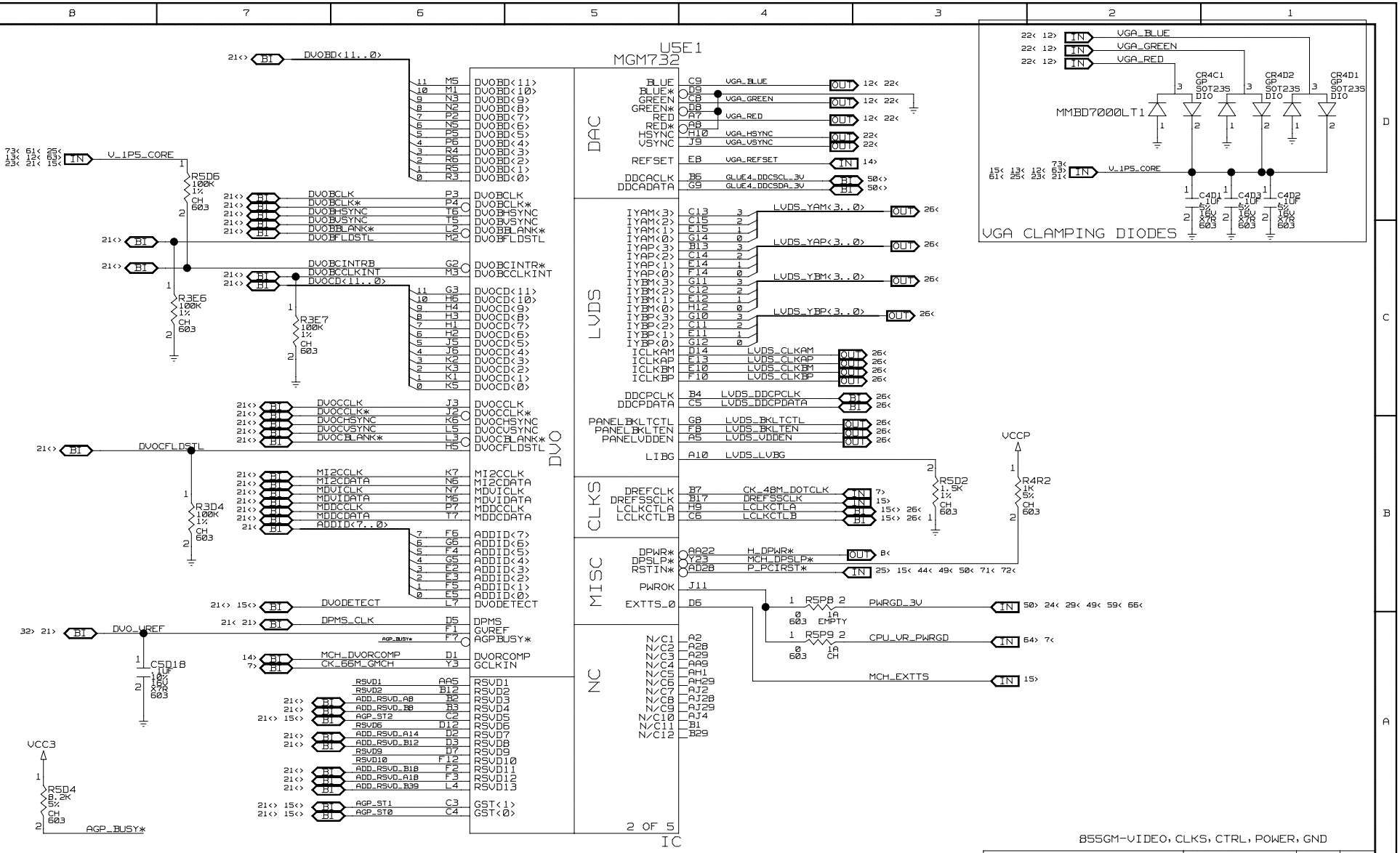




CPU CIRCUITS

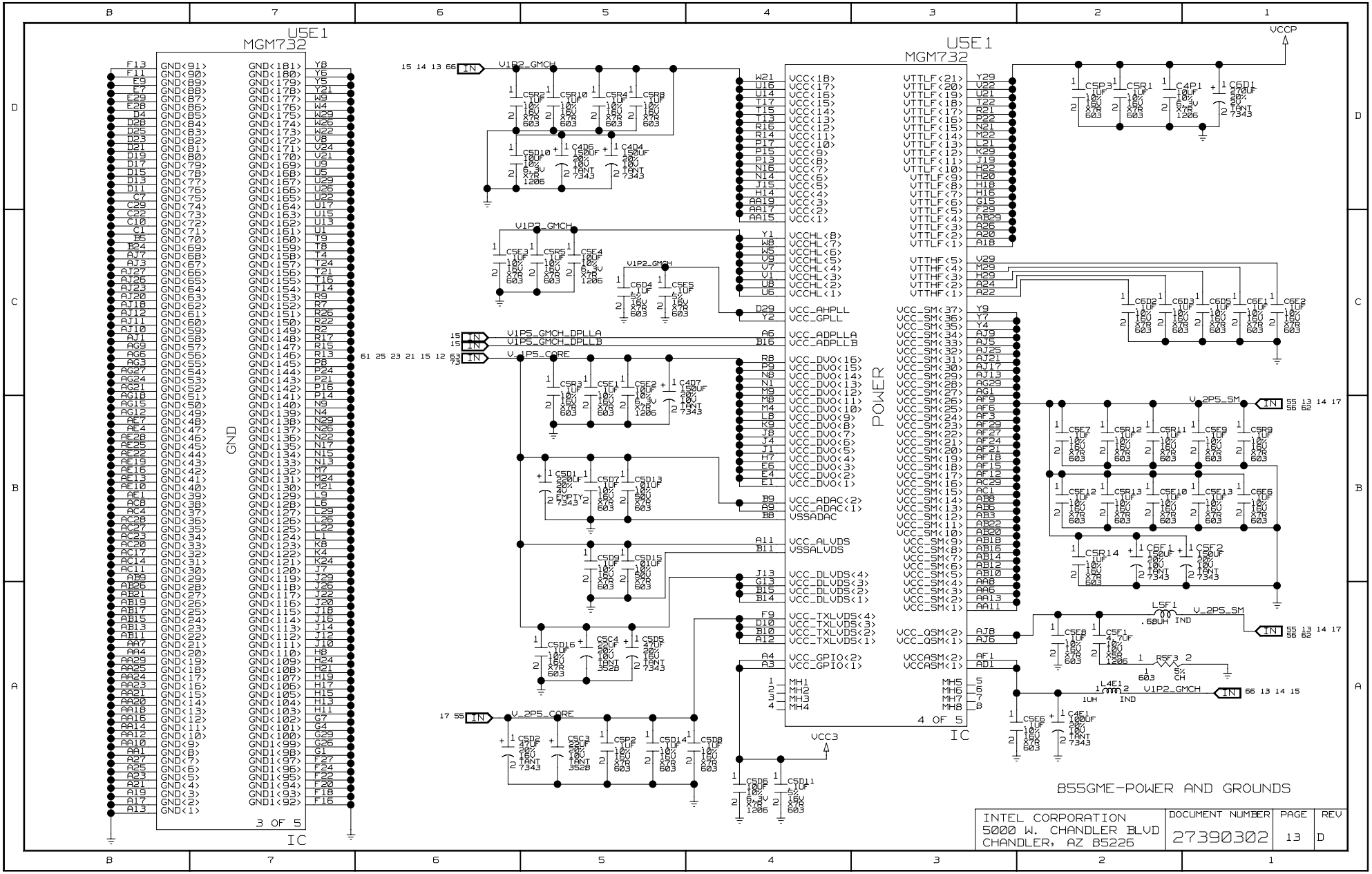
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	10	D

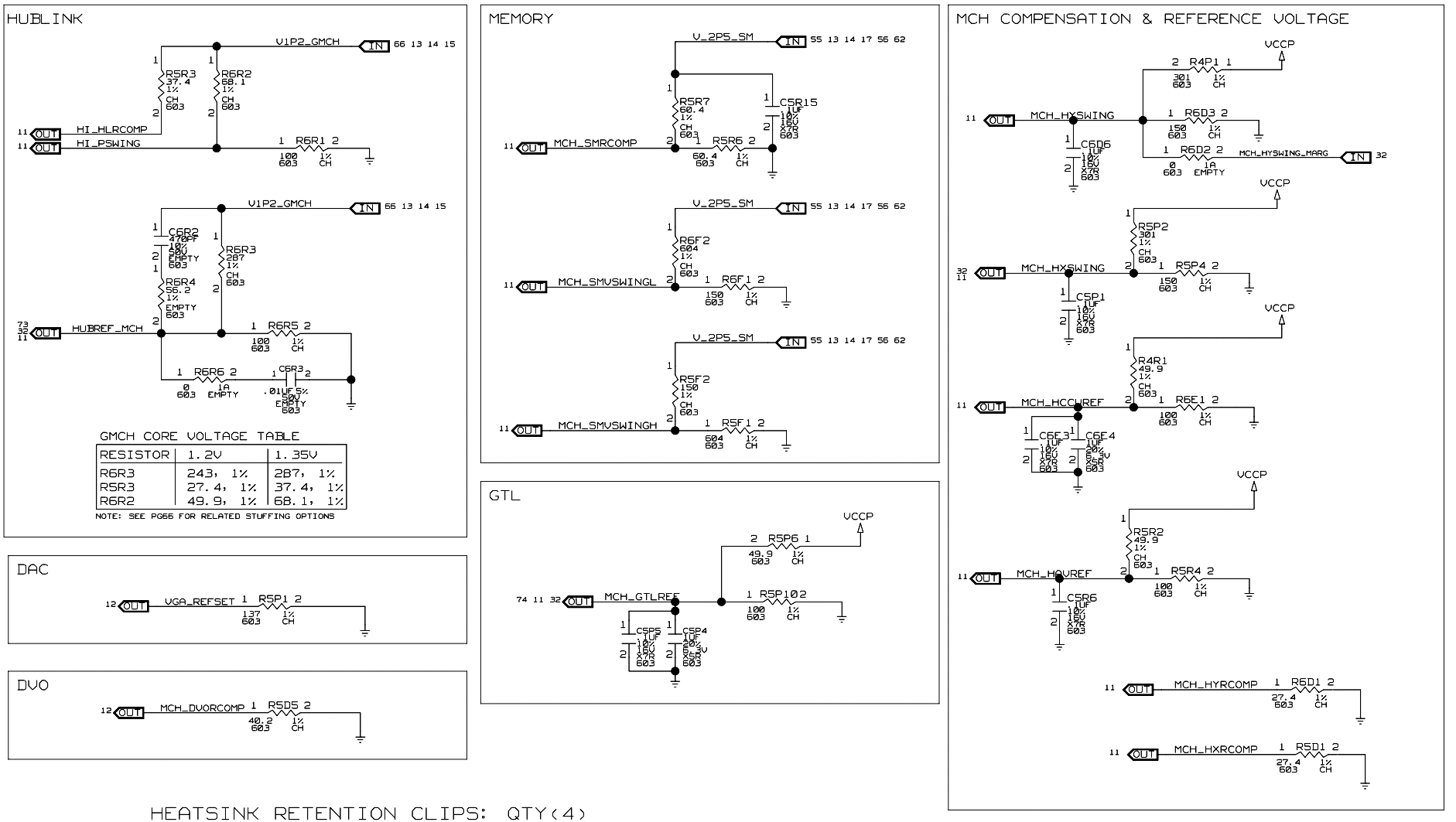

U5E1
MGM732
DDR SYSTEM MEMORY
5 OF 5
IC
M_CB<7..0>
M_DQ<63..0>
M_DQS<8..0>
M_MAA<12..0>
M_MAA_CPC<5..1>
M_MAB_CPC<5..1>
M_SCKE<3..0>
M_SCS<3..0>*
M_BS<1..0>
M_RAS*
M_CAS*
M_WE*
M_DM<8..0>
DIMM_VREF
SMVREF_0
SRCVENOUT*
SRCVENIN*
SMRCOMP
SMVSWINGL
SMVSWINGH
MCH_SMRCOMP
MCH_SMVSWINGL
MCH_SMVSWINGH
TP_M_RCV0*
TP_M_RCV1*
C6F2 1UF
C6E5 1UF
C5E11 1UF
U5E1
MGM732
HOST
HUB I/F
1 OF 5
IC
H_A<31..3>*
H_REQ<4..0>*
H_ADSTB1*
H_ADSTB0*
CK_H_100M_MCH*
CK_H_100M_MCH
MCH_HYRCOMP
MCH_HYSWING
MCH_HXRCOMP
MCH_HXSWING
H_STBN<3>*
H_STBN<2>*
H_STBN<1>*
H_STBN<0>*
H_STBP<3>*
H_STBP<2>*
H_STBP<1>*
H_STBP<0>*
H_DBI<3>*
H_DBI<2>*
H_DBI<1>*
H_DBI<0>*
H_CPURST*
MCH_GTLREF
MCH_HCCVREF
MCH_HAVREF
HI<10..0>
HI_STBS
HI_STBF
HI_HLRCOMP
HI_PSWING
HUBREF_MCH
C6R1 1UF
C5R7 1UF
H_D<63..0>*
H_ADS*
H_TRDY*
H_DRDY*
H_DEFER*
H_HITM*
H_HIT*
H_LOCK*
H_BR<0>*
H_BNR*
H_BPRI*
H_DBSY*
H_RS<2..0>*
855GME-CPU, DDR, HUB INTERFACES
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
11
REV
D



855GM-VIDEO, CLKS, CTRL, POWER, GND

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	12	D

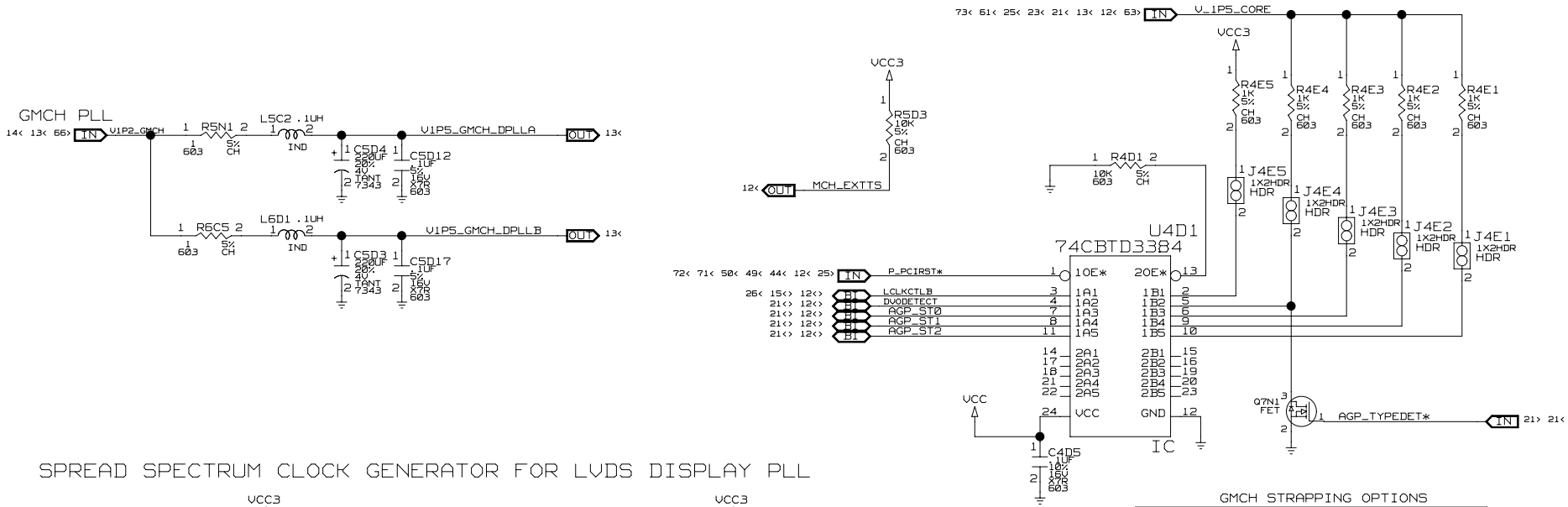

U5E1
MGM732
GND
3 OF 5
IC
U5E1
MGM732
POWER
4 OF 5
IC
V1P2_GMCH
V1P5_GMCH_DPLLA
V1P5_GMCH_DPLLB
V_1P5_CORE
V_2P5_CORE
V_2P5_SM
VCCP
VCC3
L5F1
.68UH IND
L4E1
1UH IND
R5F3 2
5%
CH
855GME-POWER AND GROUNDS
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
13
REV
D



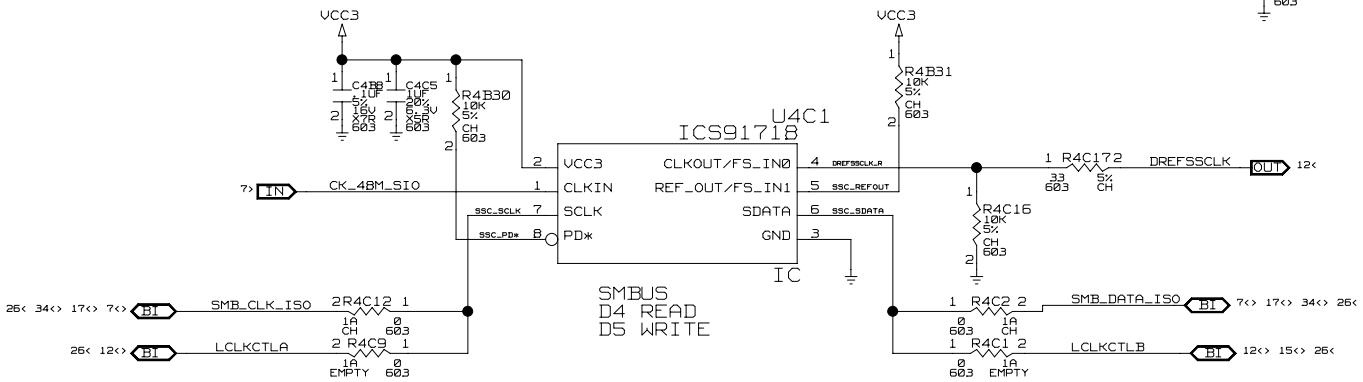
855GME-CIRCUITRY

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	14	D

GMCH STRAPPING OPTIONS



SPREAD SPECTRUM CLOCK GENERATOR FOR LVDS DISPLAY PLL



SMBUS
D4 READ
D5 WRITE

GMCH STRAPPING OPTIONS

	FUNCTION	BOAD DEFAULT	OPTIONAL OVERIDE
J4E4	DVO/AGP STRAP	NO SHUNT FOR DVO	SHUNT FOR AGP

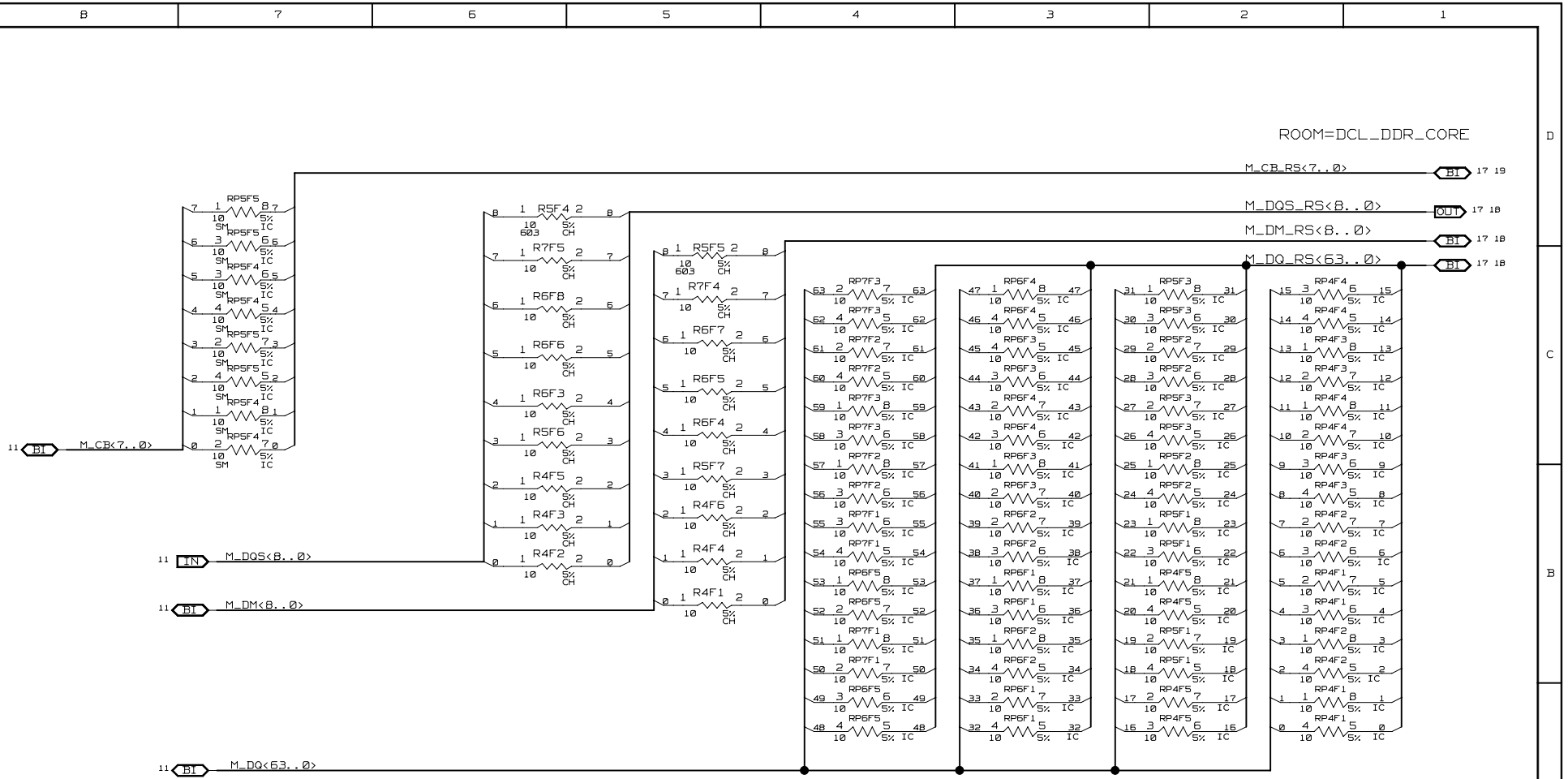
GMCH FREQUENCY STRAPPING

J4E1	J4E2	J4E3	FSB FREQ	MEM FREQ	GFX FREQ
0	0	0	400	266	200
0	0	1	400	200	200
0	1	0	400	200	133
1*	1*	1*	400	333	250

* DEFAULT STRAPPING
0 = NO SHUNT 1 = SHUNT

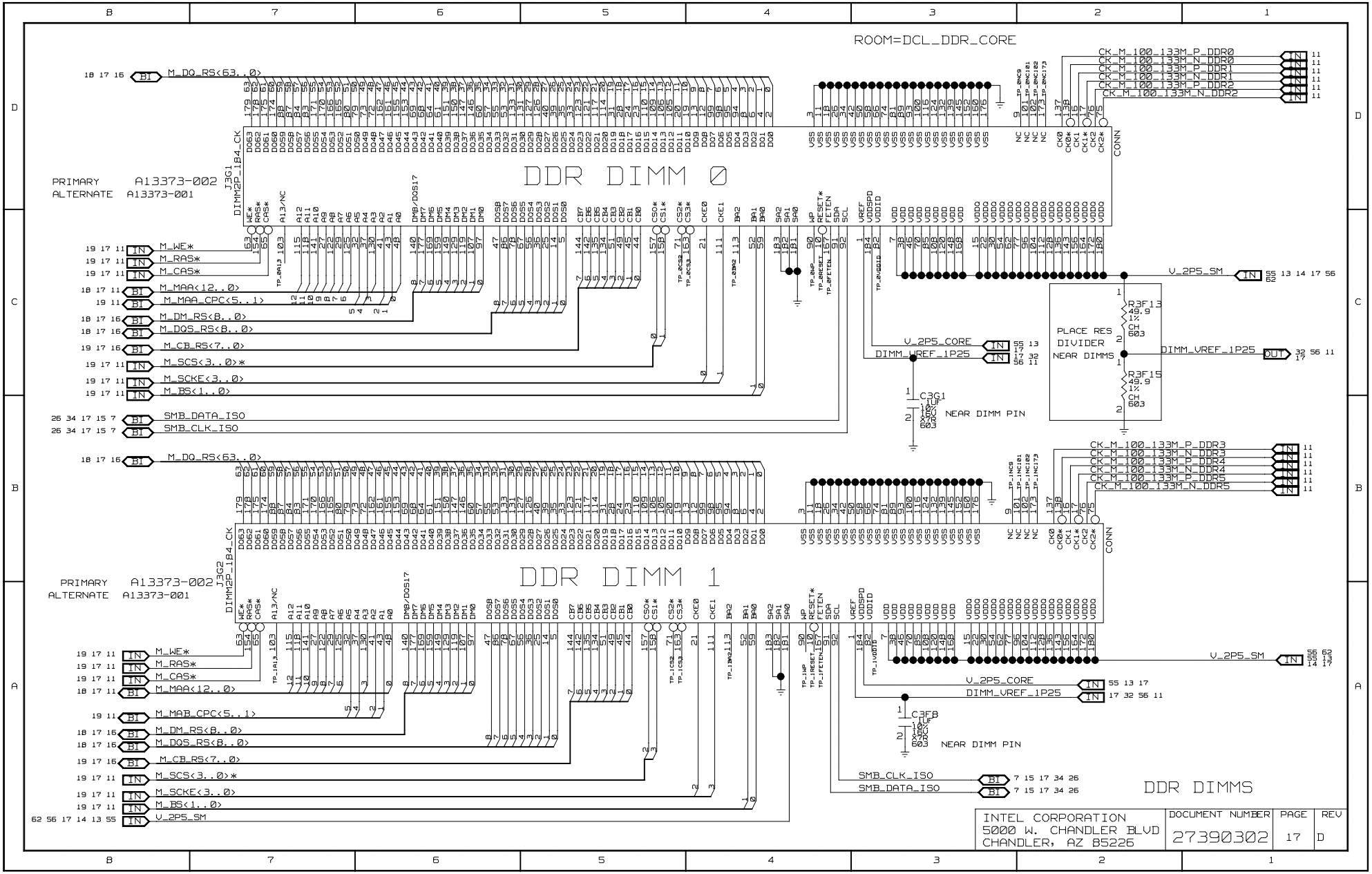
GMCH PLL AND STRAPPING & LVDS CLOCK

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	15	D

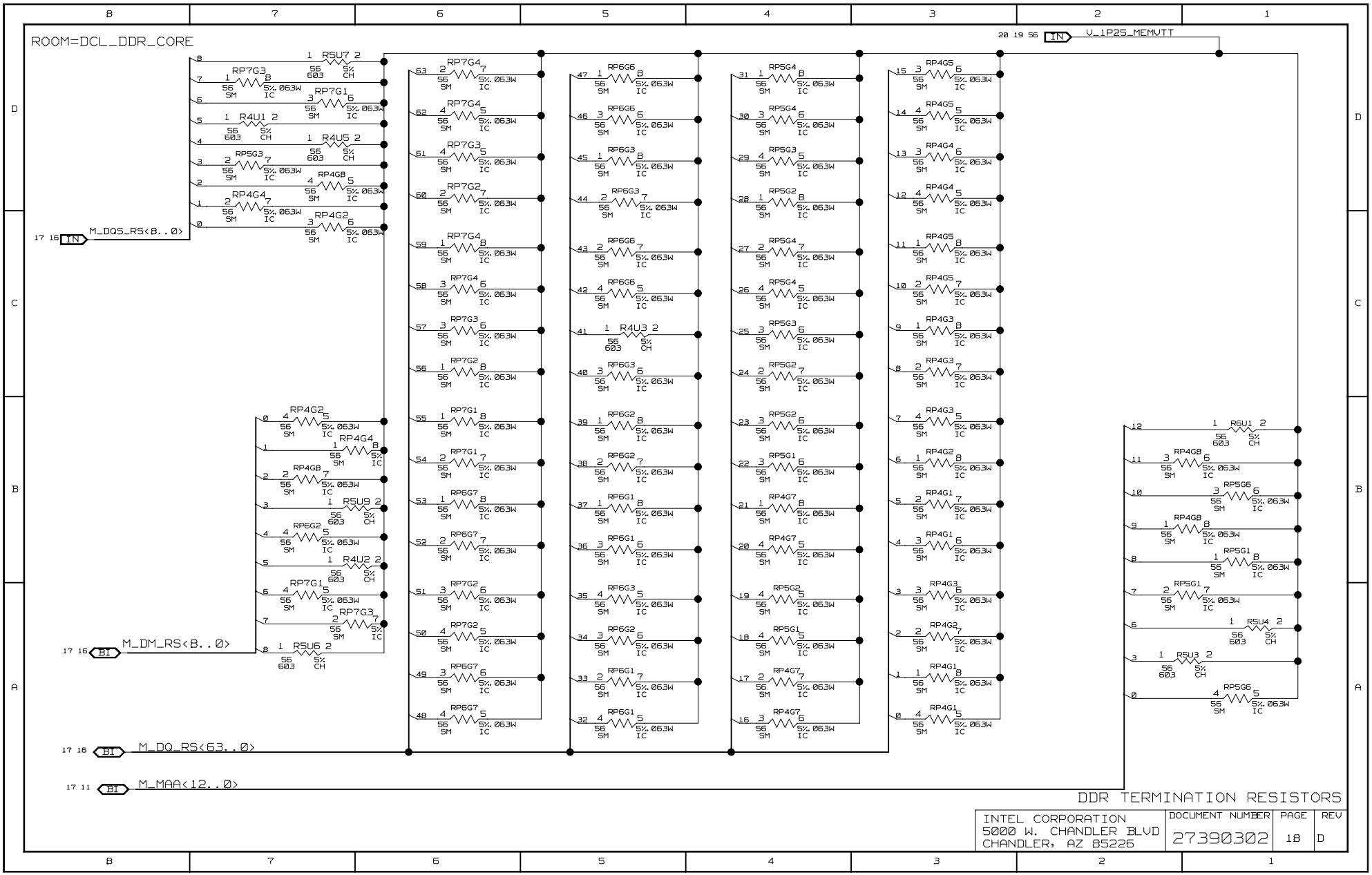


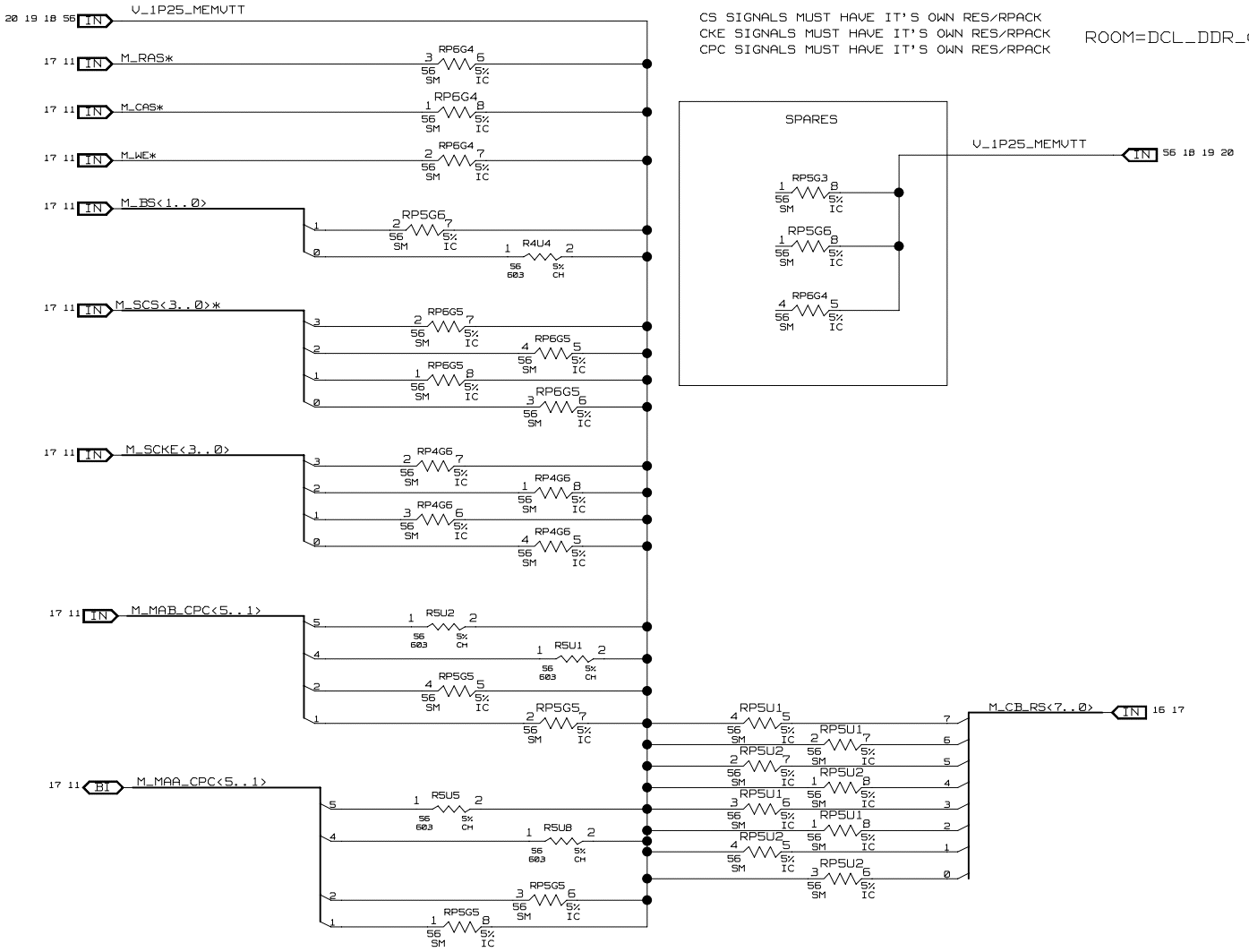
DDR SERIES RESISTORS

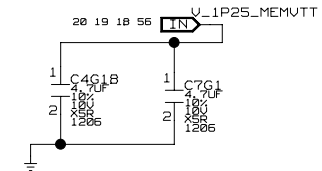
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	16	D



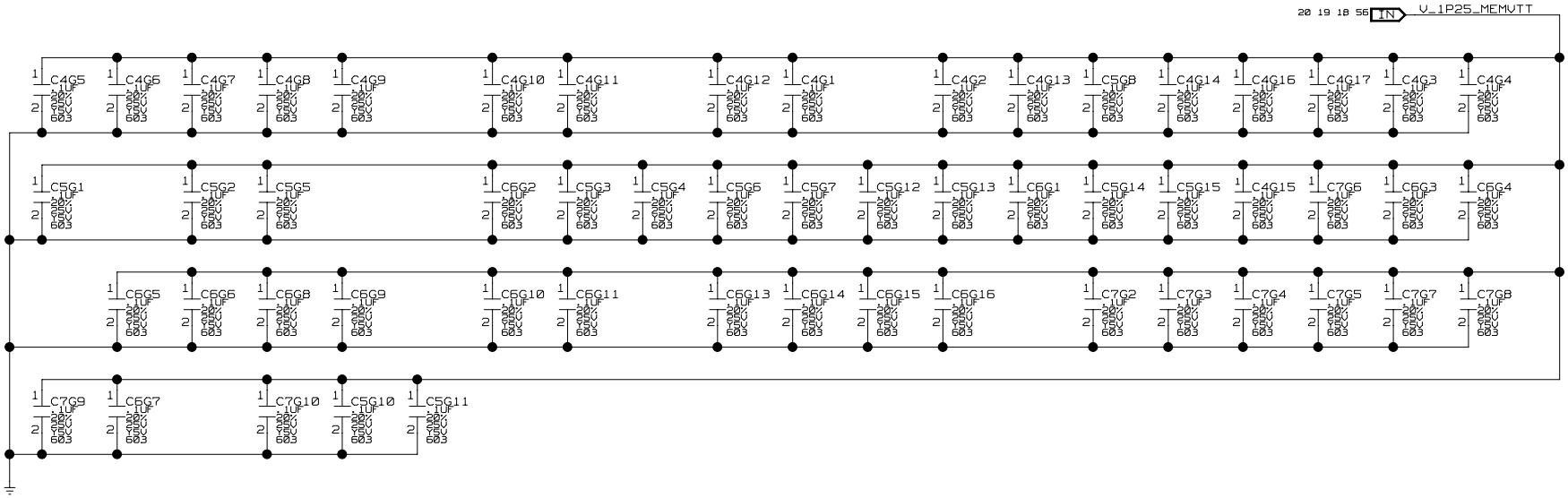
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	17	D


ROOM=DCL_DDR_CORE
20 19 56 IN V_1P25_MEMVTT
17 16 IN M_DQS_RS<8..0>
17 16 BI M_DM_RS<8..0>
17 16 BI M_DQ_RS<63..0>
17 11 BI M_MAA<12..0>
R5U7 2
RP7G3
RP7G1
R4U1 2
R4U5 2
RP5G3
RP4G8
RP4G4
RP4G2
RP7G4
RP6G5
RP5G4
RP4G5
RP6G3
RP5G2
RP4G3
RP6G2
RP5G1
RP4G1
RP7G2
RP6G7
RP4G7
RP5G6
R6U1 2
R5U4 2
R5U3 2
R4U3 2
R5U9 2
R4U2 2
R5U6 2
56 SM
56 603 5% CH
5% .063W IC
DDR TERMINATION RESISTORS
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
18
REV
D


NOTE:
CS SIGNALS MUST HAVE IT'S OWN RES/RPACK
CKE SIGNALS MUST HAVE IT'S OWN RES/RPACK
CPC SIGNALS MUST HAVE IT'S OWN RES/RPACK
ROOM=DCL_DDR_CORE
SPARES
V_1P25_MEMVTT
M_RAS*
M_CAS*
M_WE*
M_BS<1..0>
M_SCS<3..0>*
M_SCKE<3..0>
M_MAB_CPC<5..1>
M_MAA_CPC<5..1>
M_CB_RS<7..0>
DDR TERMINATION RESISTORS
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
19
REV
D

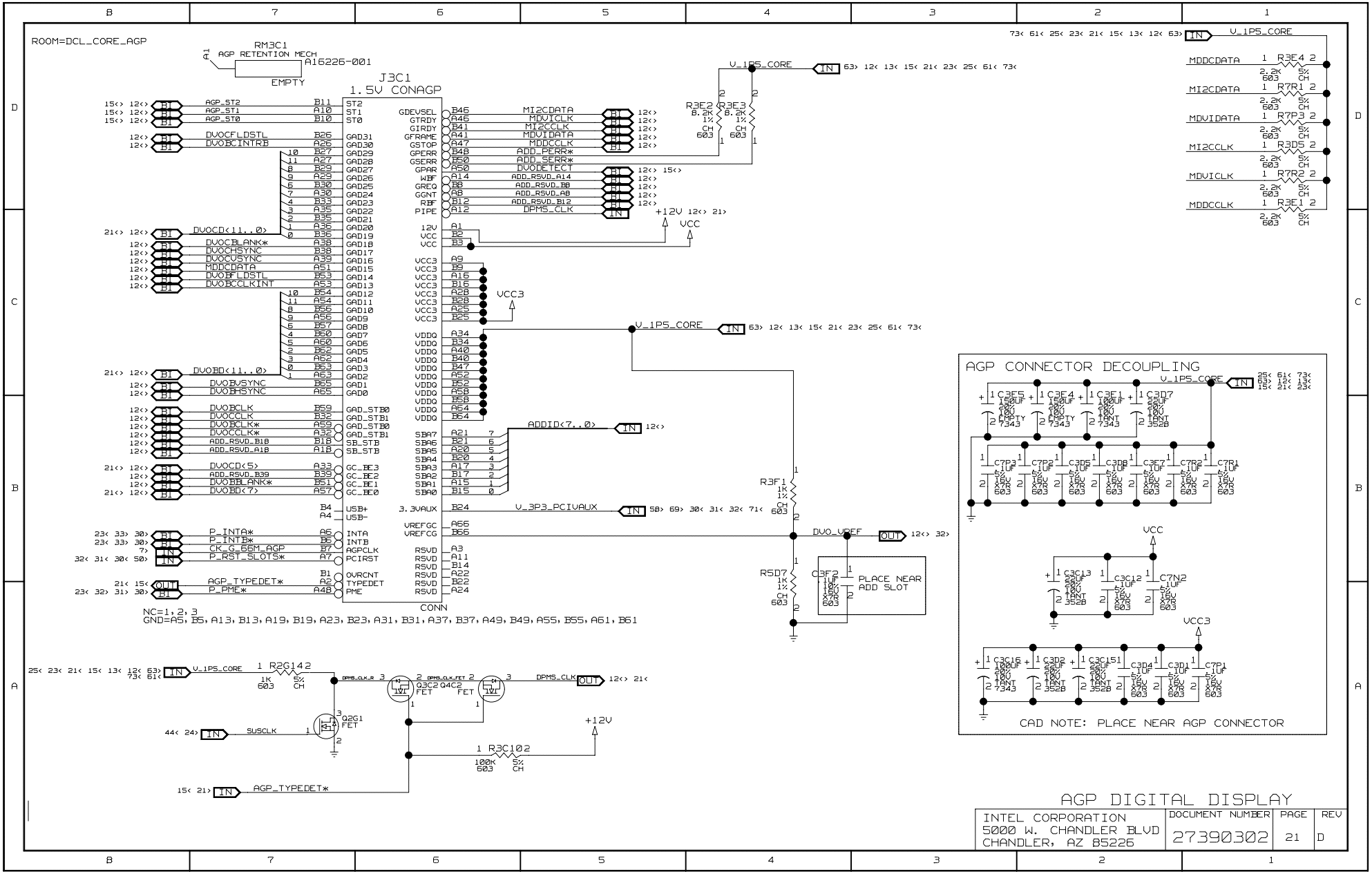


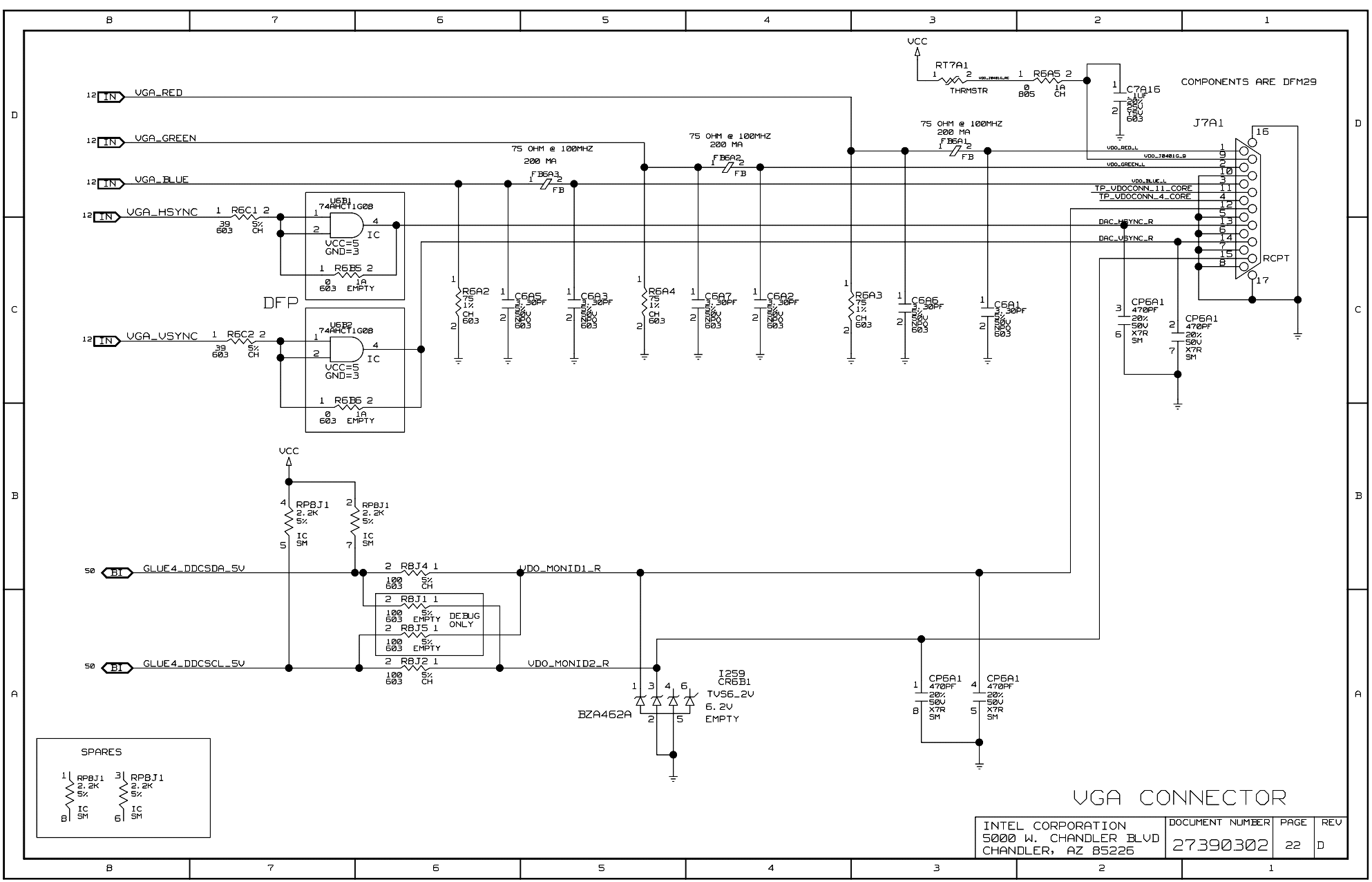
PLACED AT LEFT AND RIGHT ENDS
OF VTT ISLAND

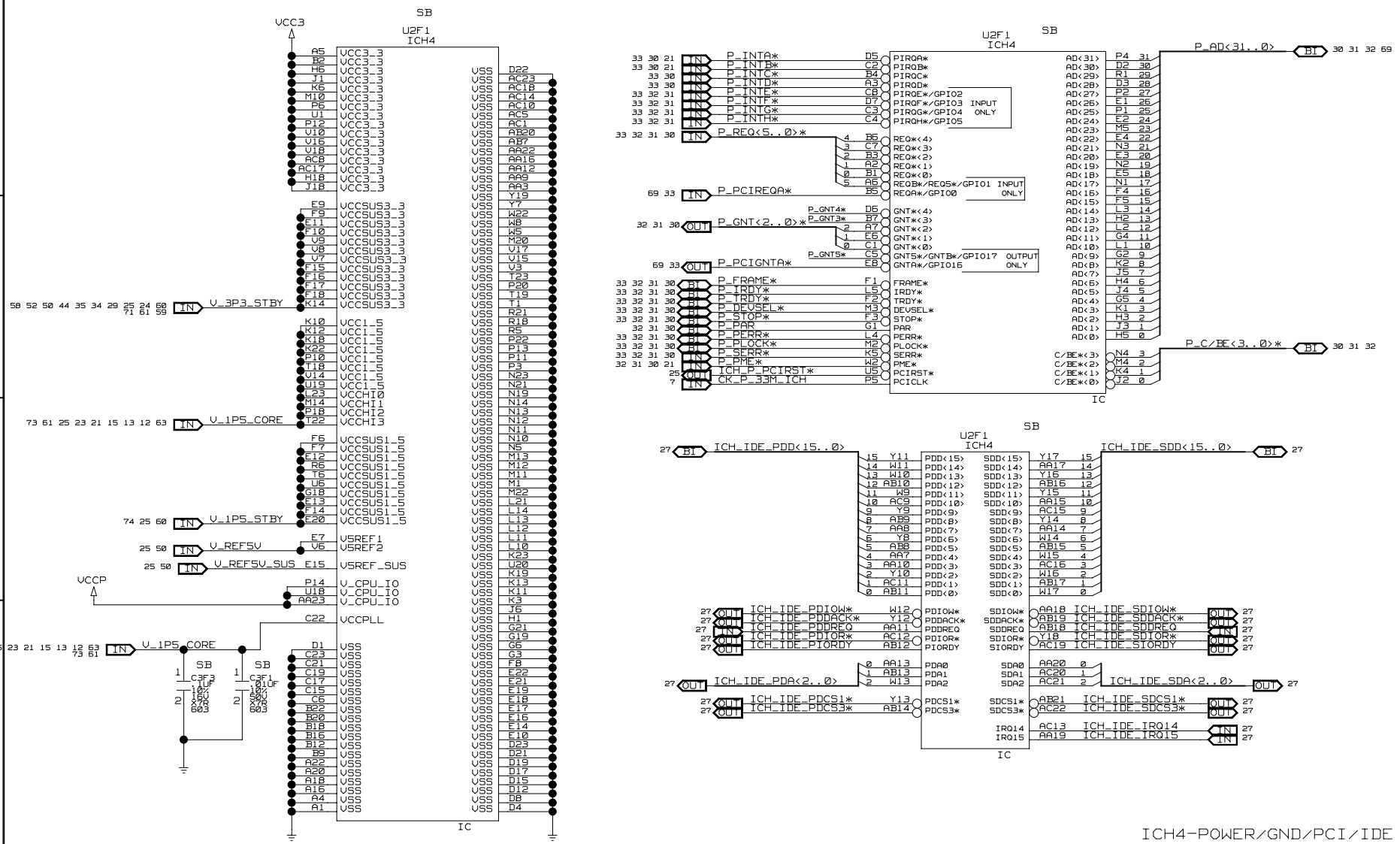


DECOUPLING CAPACITORS FOR DDR TERMINATION RESISTORS

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	20	D

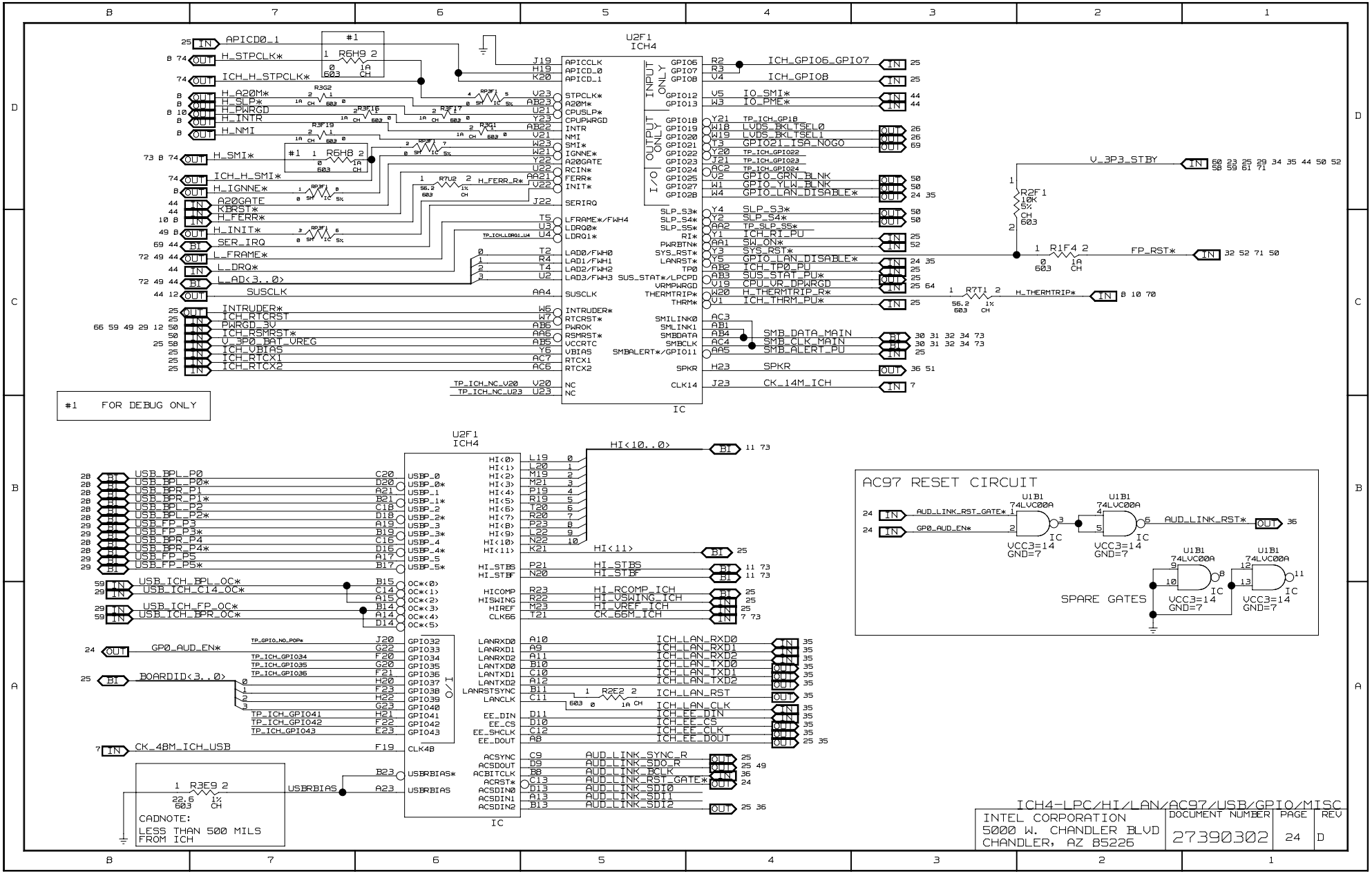

ROOM=DCL_CORE_AGP
RM3C1
AGP RETENTION MECH
A16226-001
EMPTY
J3C1
1.5V CONAGP
CONN
NC=1, 2, 3
GND=A5, B5, A13, B13, A19, B19, A23, B23, A31, B31, A37, B37, A49, B49, A55, B55, A61, B61
V_1P5_CORE
V_3P3_PCIVAUX
DVO_VREF
VCC
VCC3
+12V
ADDID<7..0>
DVOCD<11..0>
DVOBD<11..0>
AGP_TYPEDET*
DPMS_CLK
SUSCLK
AGP CONNECTOR DECOUPLING
PLACE NEAR ADD SLOT
CAD NOTE: PLACE NEAR AGP CONNECTOR
AGP DIGITAL DISPLAY
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
21
REV
D

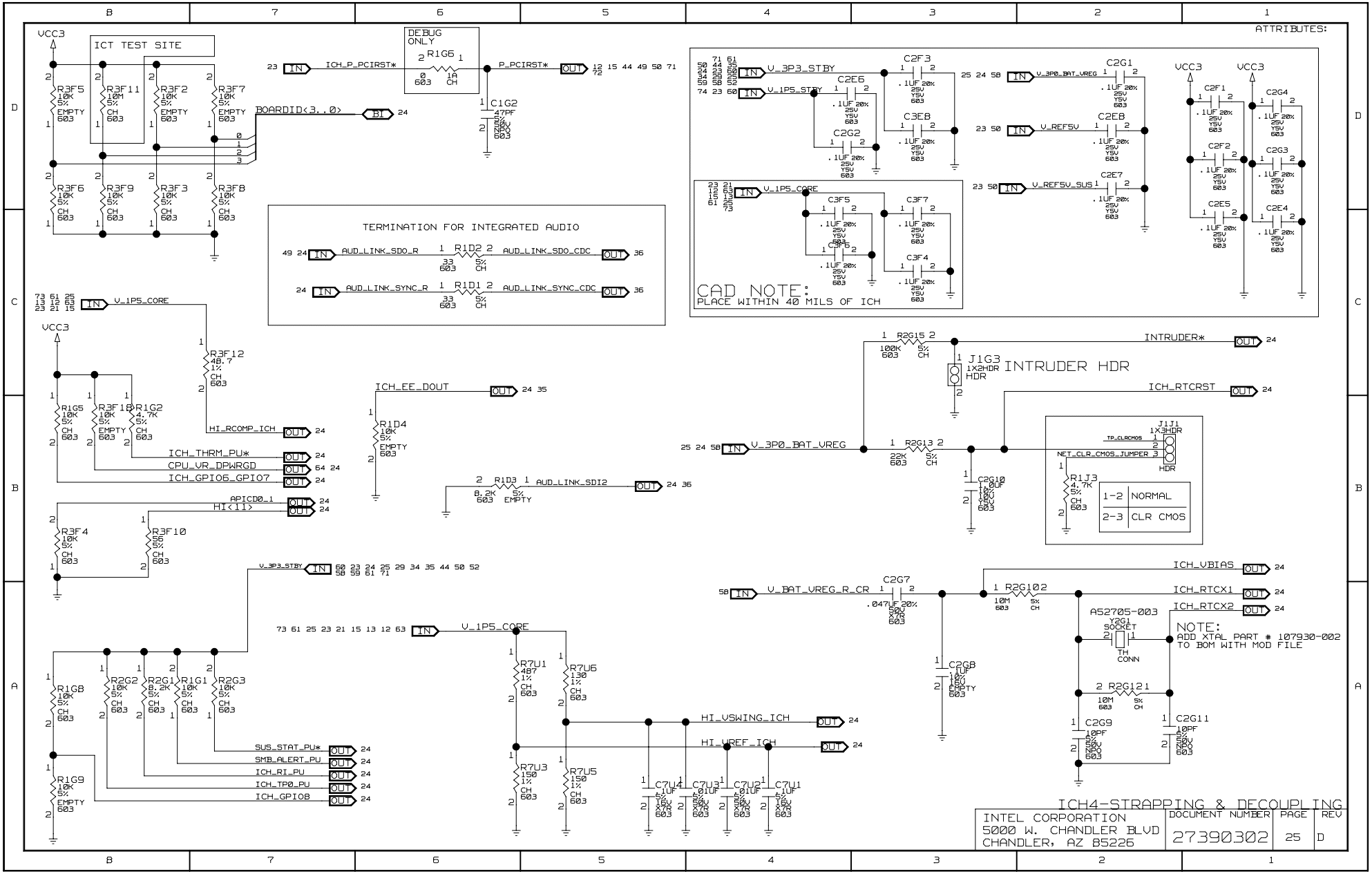

VGA_RED
VGA_GREEN
VGA_BLUE
VGA_HSYNC
VGA_VSYNC
DFP
VCC
RT7A1
THRMSTR
COMPONENTS ARE DFM29
J7A1
RCPT
75 OHM @ 100MHZ
200 MA
U6B1
U6B2
74AHCT1G08
VCC=5
GND=3
DAC_HSYNC_R
DAC_VSYNC_R
TP_VDOCONN_11_CORE
TP_VDOCONN_4_CORE
GLUE4_DDCSDA_5V
GLUE4_DDCSCL_5V
VDO_MONID1_R
VDO_MONID2_R
DEBUG ONLY
EMPTY
I259
CR6B1
TVS6_2V
6.2V
BZA462A
SPARES
VGA CONNECTOR
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
22
REV
D

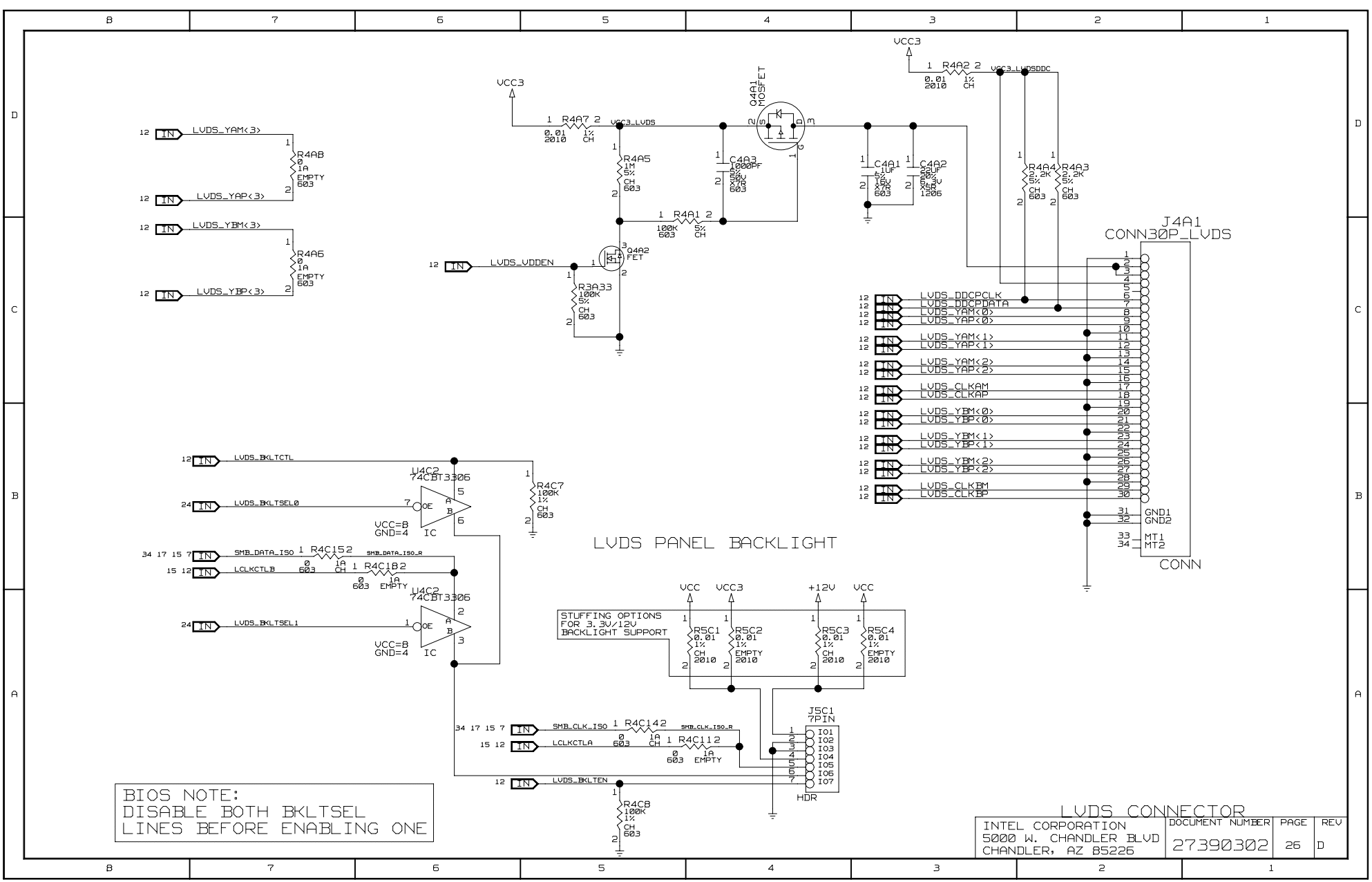


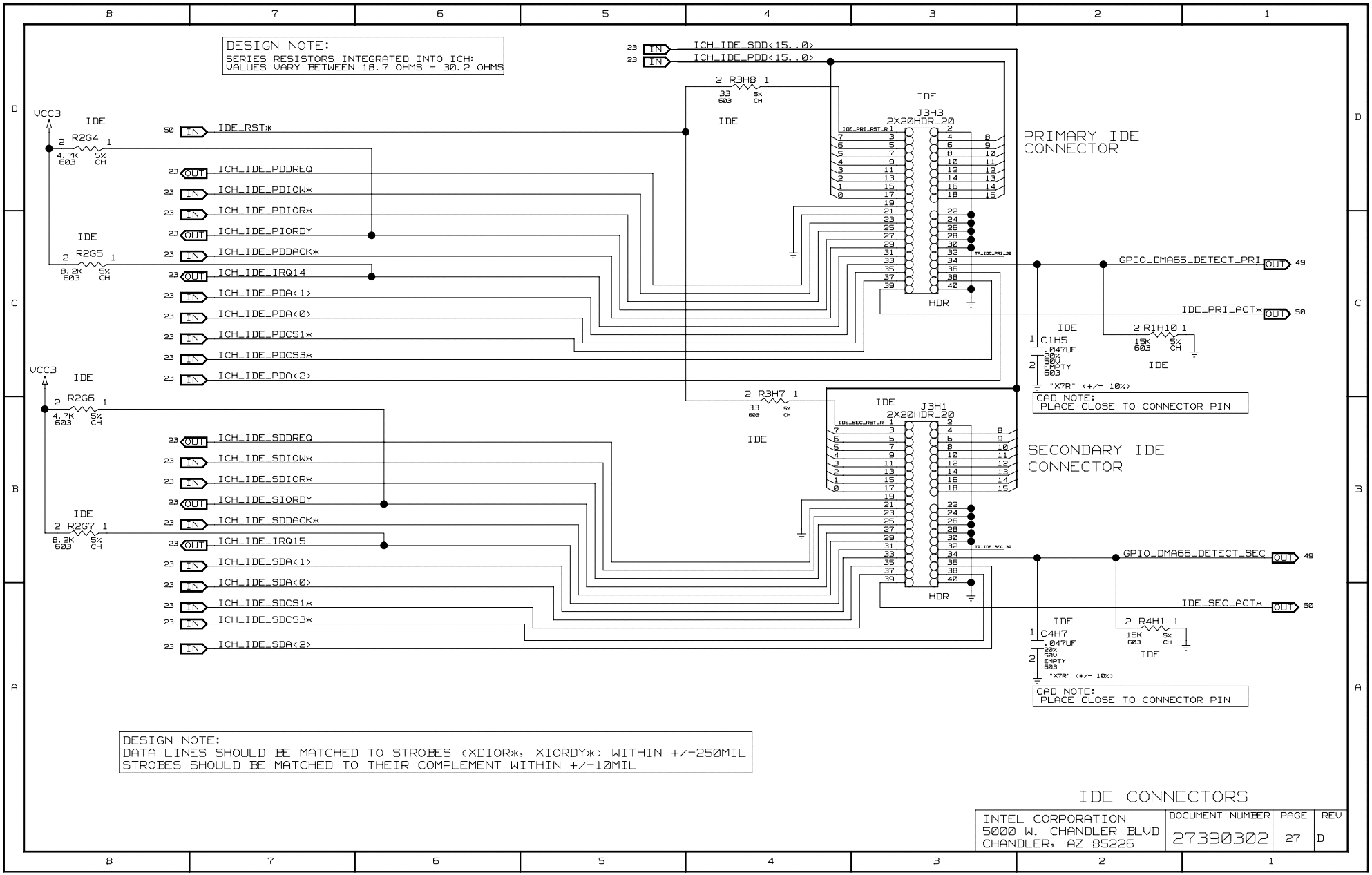
ICH4-POWER/GND/PCI/IDE

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	23	D


U2F1
ICH4
IC
#1 FOR DEBUG ONLY
AC97 RESET CIRCUIT
U1B1
74LVC00A
VCC3=14
GND=7
SPARE GATES
CADNOTE:
LESS THAN 500 MILS
FROM ICH
ICH4-LPC/HI/LAN/AC97/USB/GPIO/MISC
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
24
REV
D

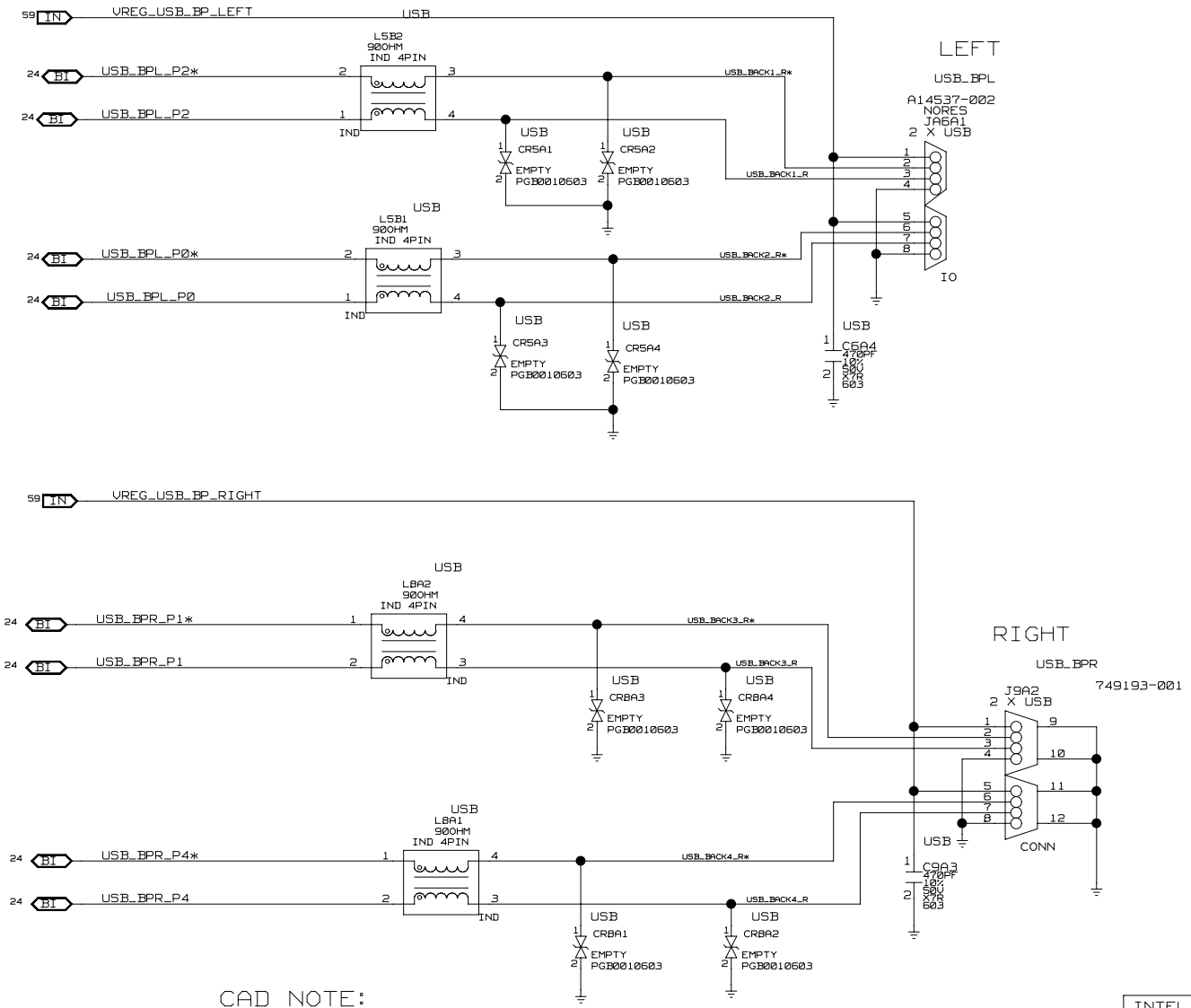

ATTRIBUTES:
ICT TEST SITE
DEBUG ONLY
TERMINATION FOR INTEGRATED AUDIO
CAD NOTE:
PLACE WITHIN 40 MILS OF ICH
J1G3 1X2HDR HDR
INTRUDER HDR
J1J1 1X3HDR HDR
1-2 NORMAL
2-3 CLR CMOS
A52705-003
Y2G1 SOCKET
TH CONN
NOTE:
ADD XTAL PART # 107930-002
TO BOM WITH MOD FILE
ICH4-STRAPPING & DECOUPLING
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER 27390302
PAGE 25
REV D


LVDS_YAM<3>
LVDS_YAP<3>
LVDS_YBM<3>
LVDS_YBP<3>
R4A8
R4A6
VCC3
R4A7 2
VCC3_LVDS
Q4A1 MOSFET
R4A5
C4A3
R4A1 2
Q4A2 FET
LVDS_VDDEN
R3A33
R4A2 2
VCC3_LVDSDDC
C4A1
C4A2
R4A4
R4A3
J4A1
CONN30P_LVDS
LVDS_DDCPCLK
LVDS_DDCPDATA
LVDS_YAM<0>
LVDS_YAP<0>
LVDS_YAM<1>
LVDS_YAP<1>
LVDS_YAM<2>
LVDS_YAP<2>
LVDS_CLKAM
LVDS_CLKAP
LVDS_YBM<0>
LVDS_YBP<0>
LVDS_YBM<1>
LVDS_YBP<1>
LVDS_YBM<2>
LVDS_YBP<2>
LVDS_CLKBM
LVDS_CLKBP
GND1
GND2
MT1
MT2
CONN
LVDS_BKLTCTL
LVDS_BKLTSEL0
LVDS_BKLTSEL1
U4C2
74CBT3306
VCC=B
GND=4
IC
R4C7
100K
SMB_DATA_ISO
LCLKCTLB
R4C152
R4C182
SMB_DATA_ISO_R
LVDS PANEL BACKLIGHT
STUFFING OPTIONS
FOR 3.3V/12V
BACKLIGHT SUPPORT
VCC
VCC3
+12V
R5C1
R5C2
R5C3
R5C4
SMB_CLK_ISO
LCLKCTLA
R4C142
R4C112
SMB_CLK_ISO_R
J5C1
7PIN
HDR
LVDS_BKLTEN
R4C8
BIOS NOTE:
DISABLE BOTH BKLTSEL
LINES BEFORE ENABLING ONE
LVDS CONNECTOR
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
26
REV
D



IDE CONNECTORS

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	27	D



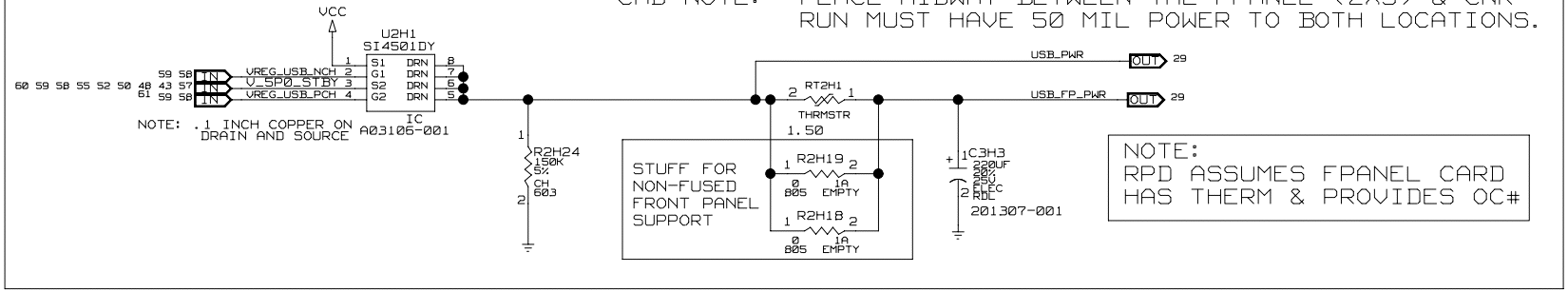
CAD NOTE:
PLACE NEAR USB CONN

BACK PANEL USB

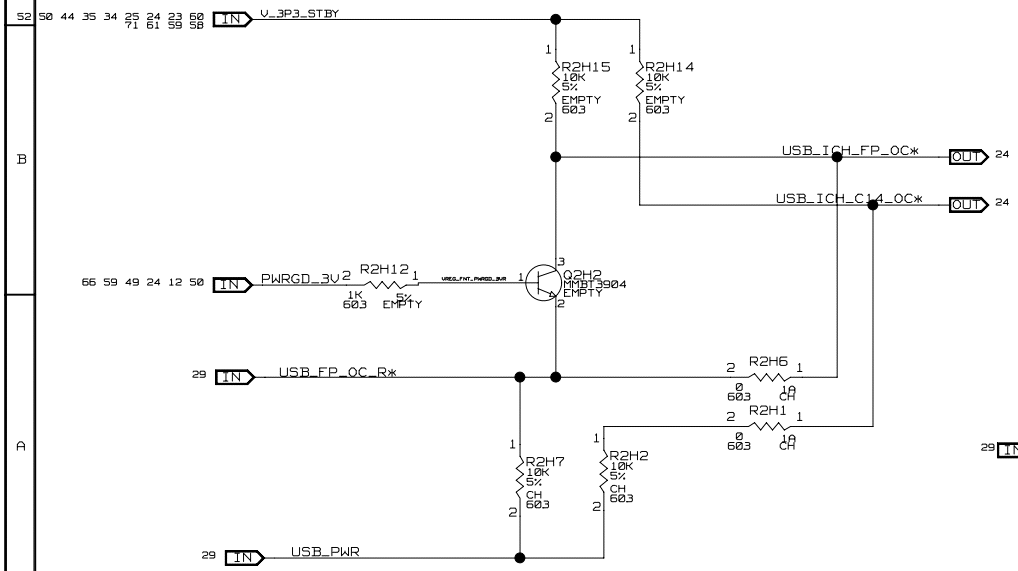
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	28	D

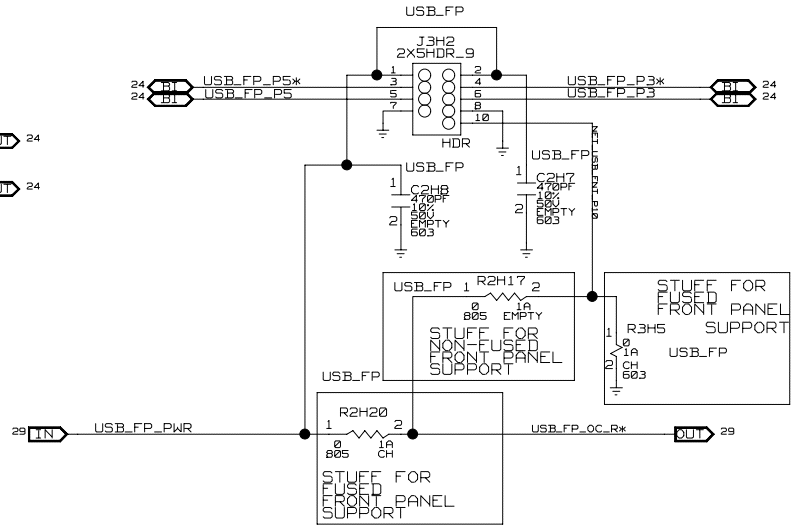
CAD NOTE;
TRACE ROUTING IS 7.5 MIL, 7.5 MIL SPACING

CAD NOTE: PLACE MIDWAY BETWEEN THE FPANEL (2X5) & CNR
RUN MUST HAVE 50 MIL POWER TO BOTH LOCATIONS.



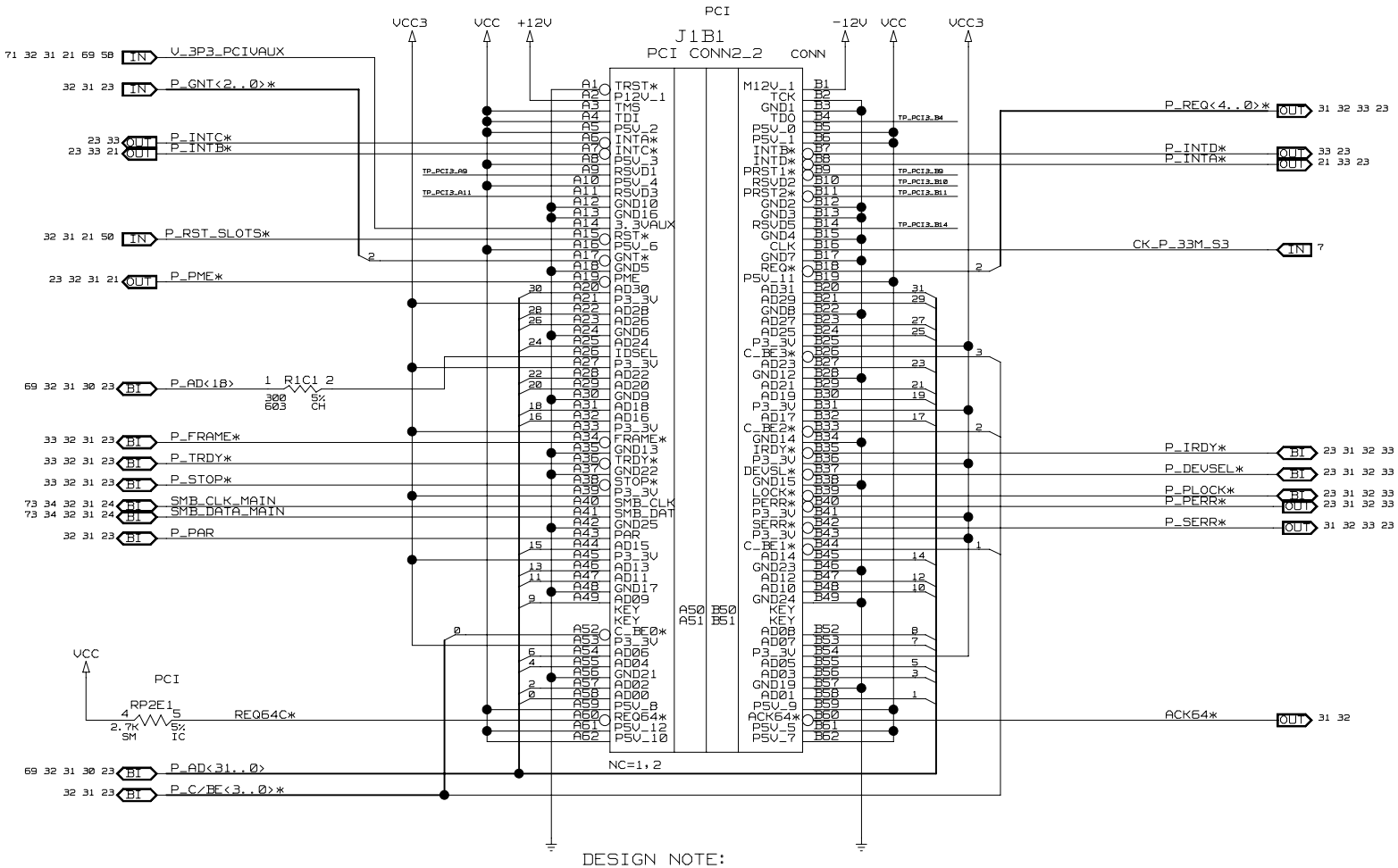
CAD NOTE:
LEAVE ROOM FOR 2 CHOKES,
1 THERMISTER AND 1 TH CAP.





USB FNT PANEL/POWER

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	29	D



DESIGN NOTE:

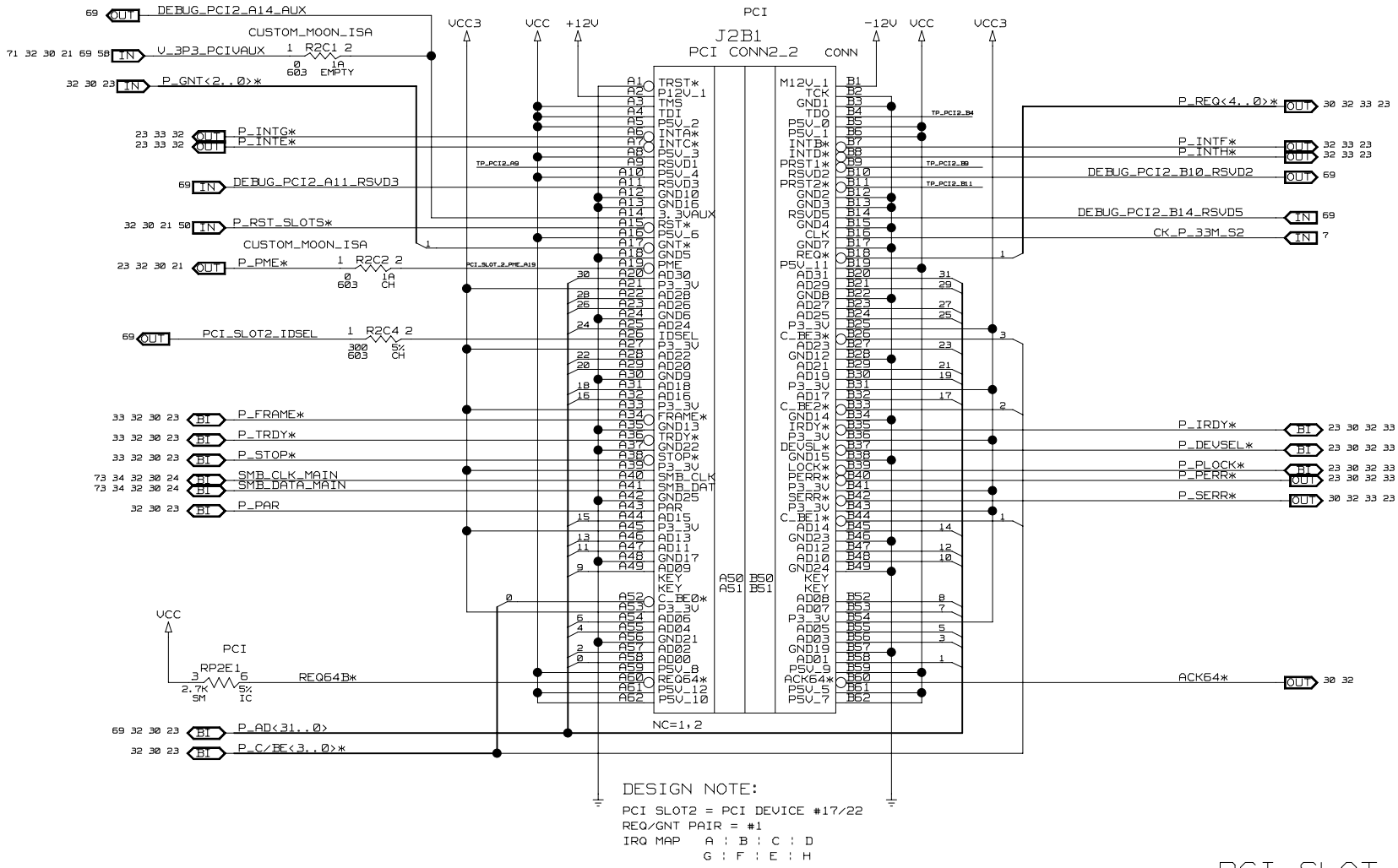
PCI SLOT3 = PCI DEVICE #18
REQ/GNT PAIR = #2
IRQ MAP A : B : C : D
C : D : B : A

PCI SLOT 3

[PAGE_TITLE=PCI_SLOT3]

PCI SLOT 3

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	30	D

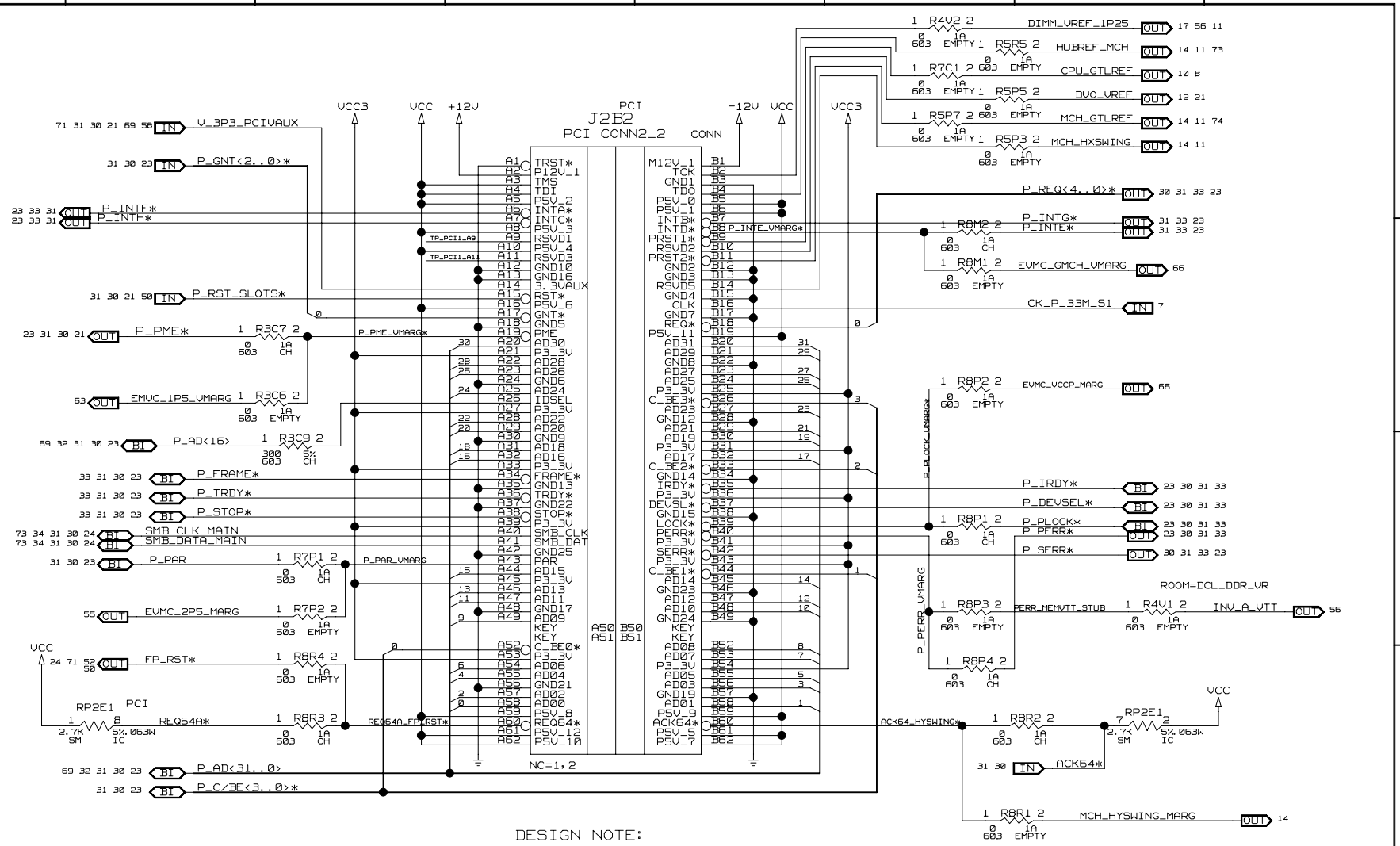


DESIGN NOTE:

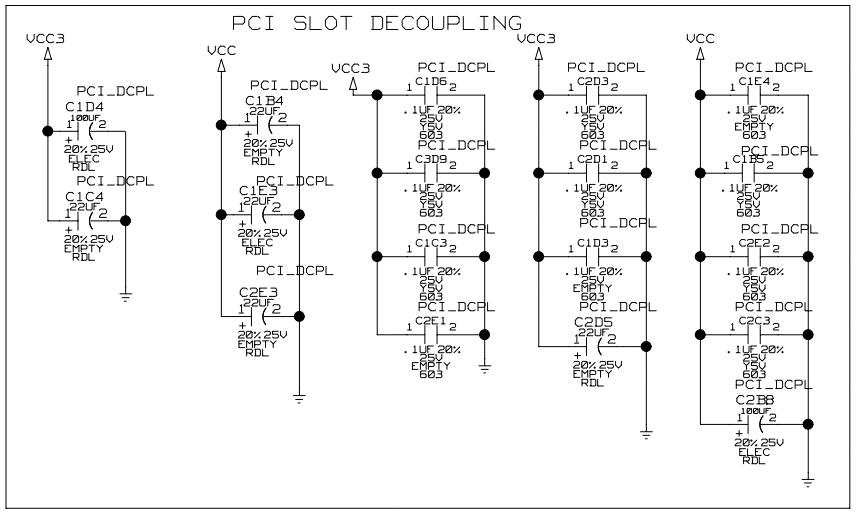
PCI SLOT2 = PCI DEVICE #17/22
REQ/GNT PAIR = #1
IRQ MAP A : B : C : D
G : F : E : H

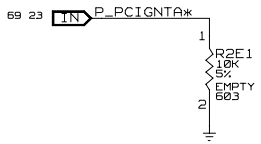
PCI SLOT 2

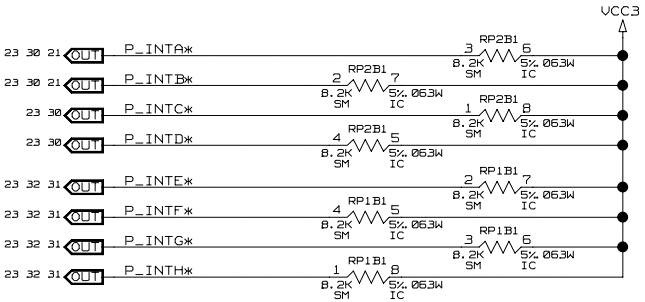
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	31	D

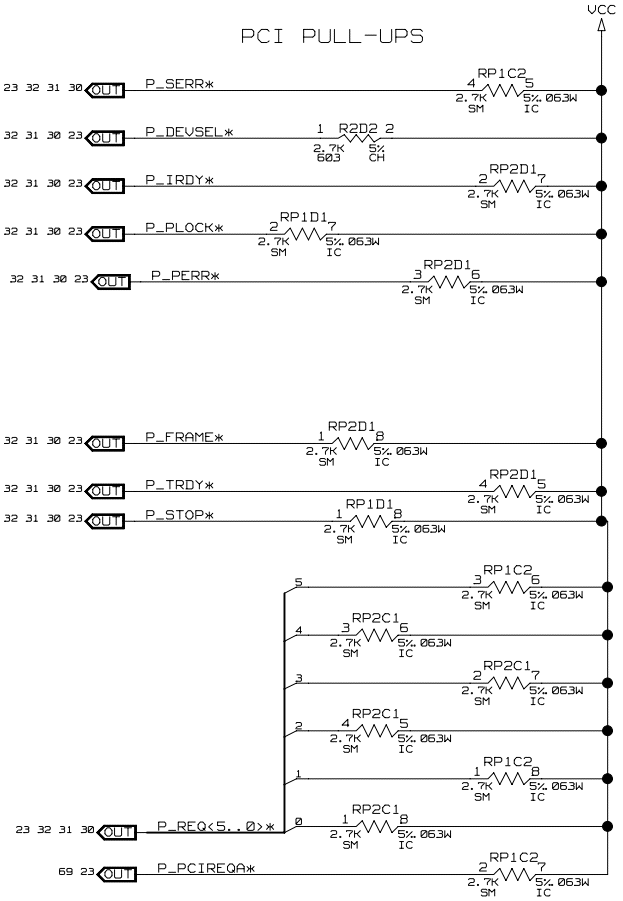


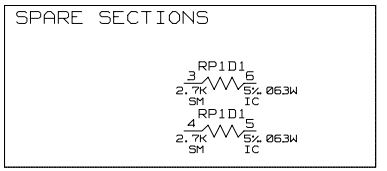
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	32	D





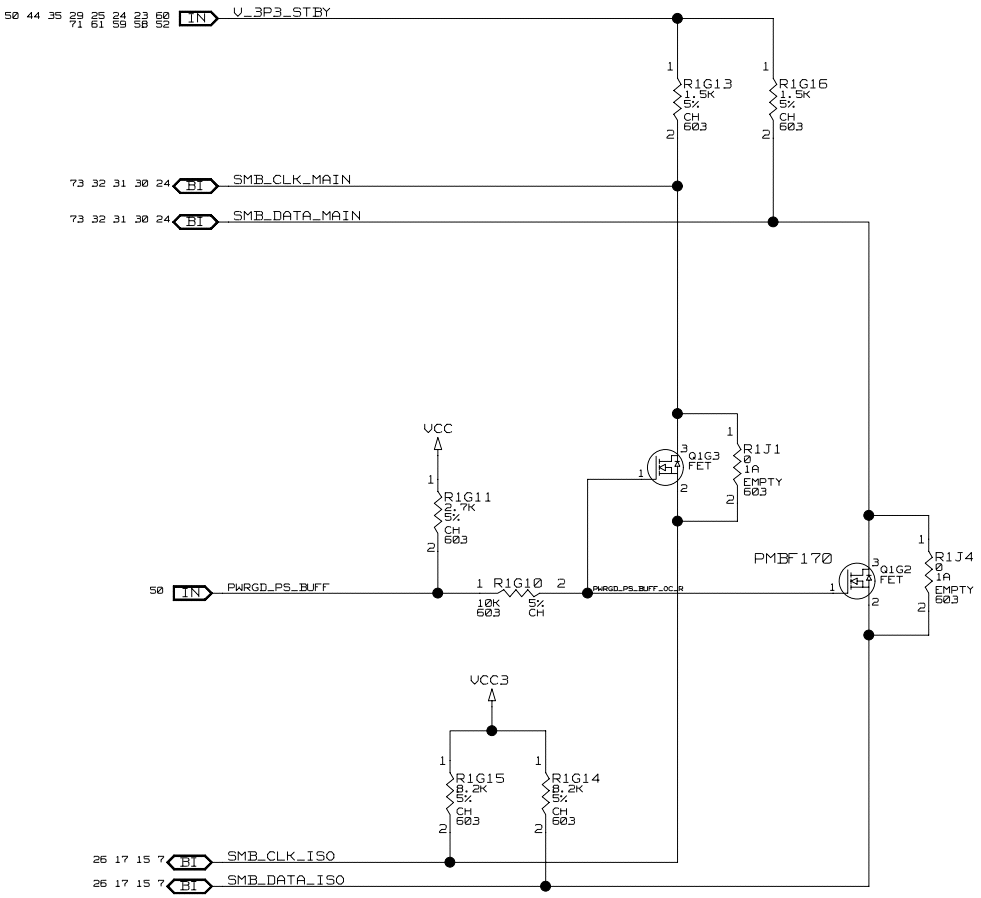


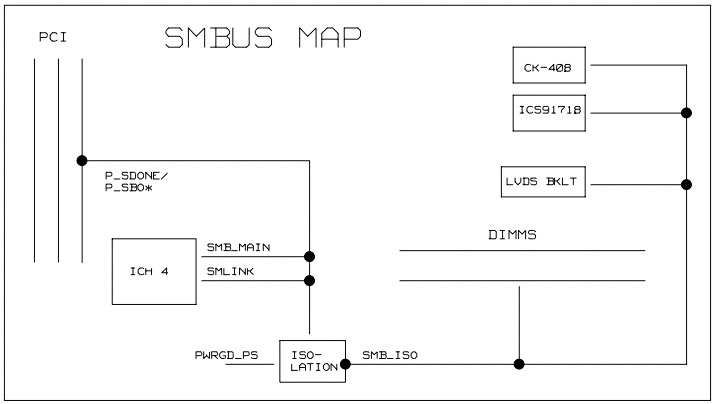




PCI TERMINATION AND DECOUPLING

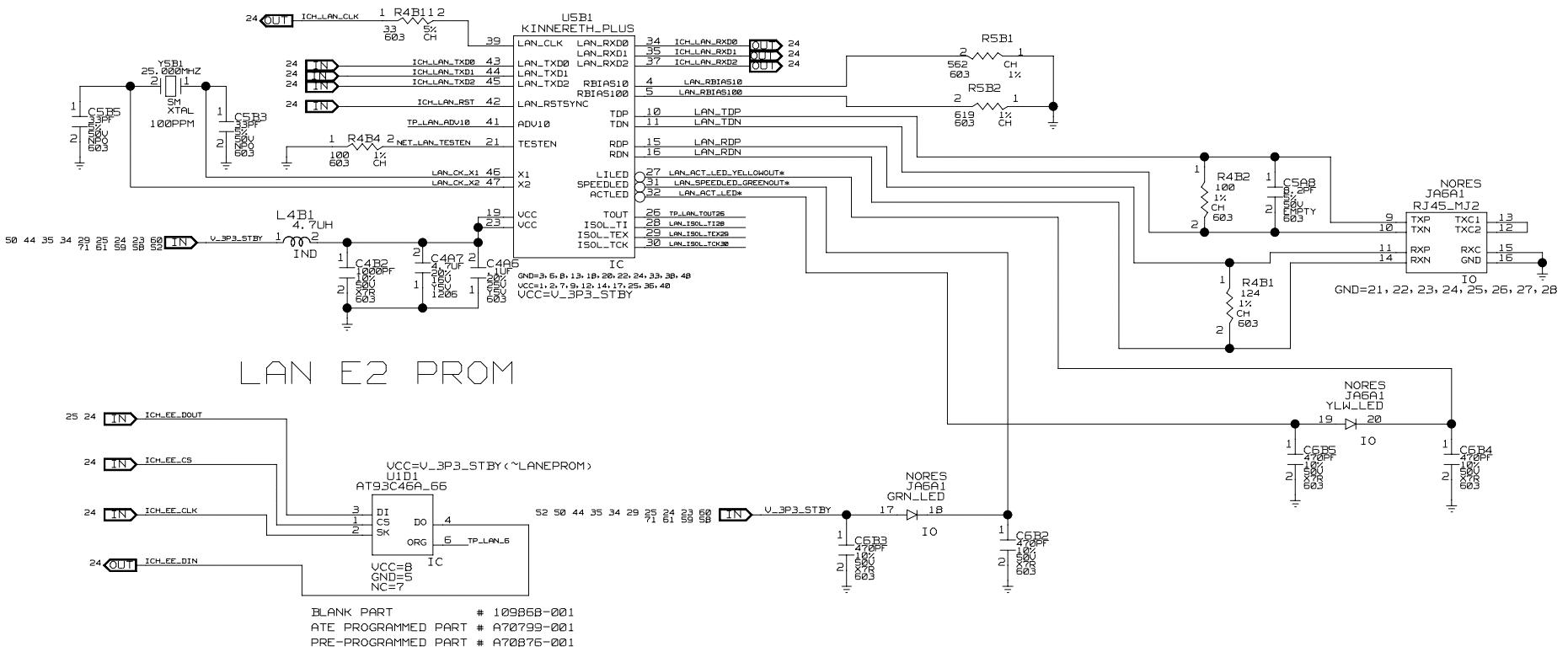
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	33	D



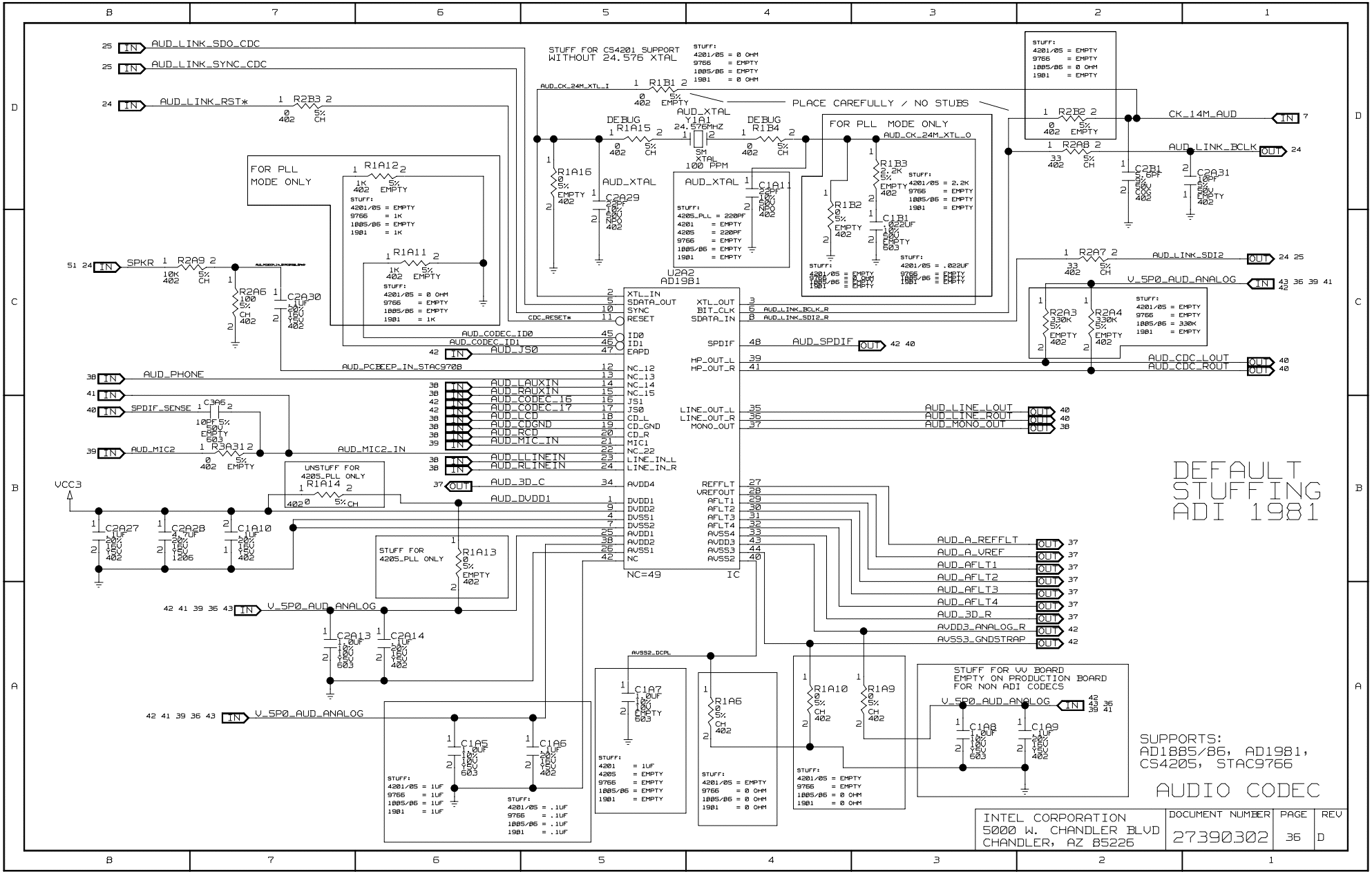


SMBUS ISOLATION CIRCUIT

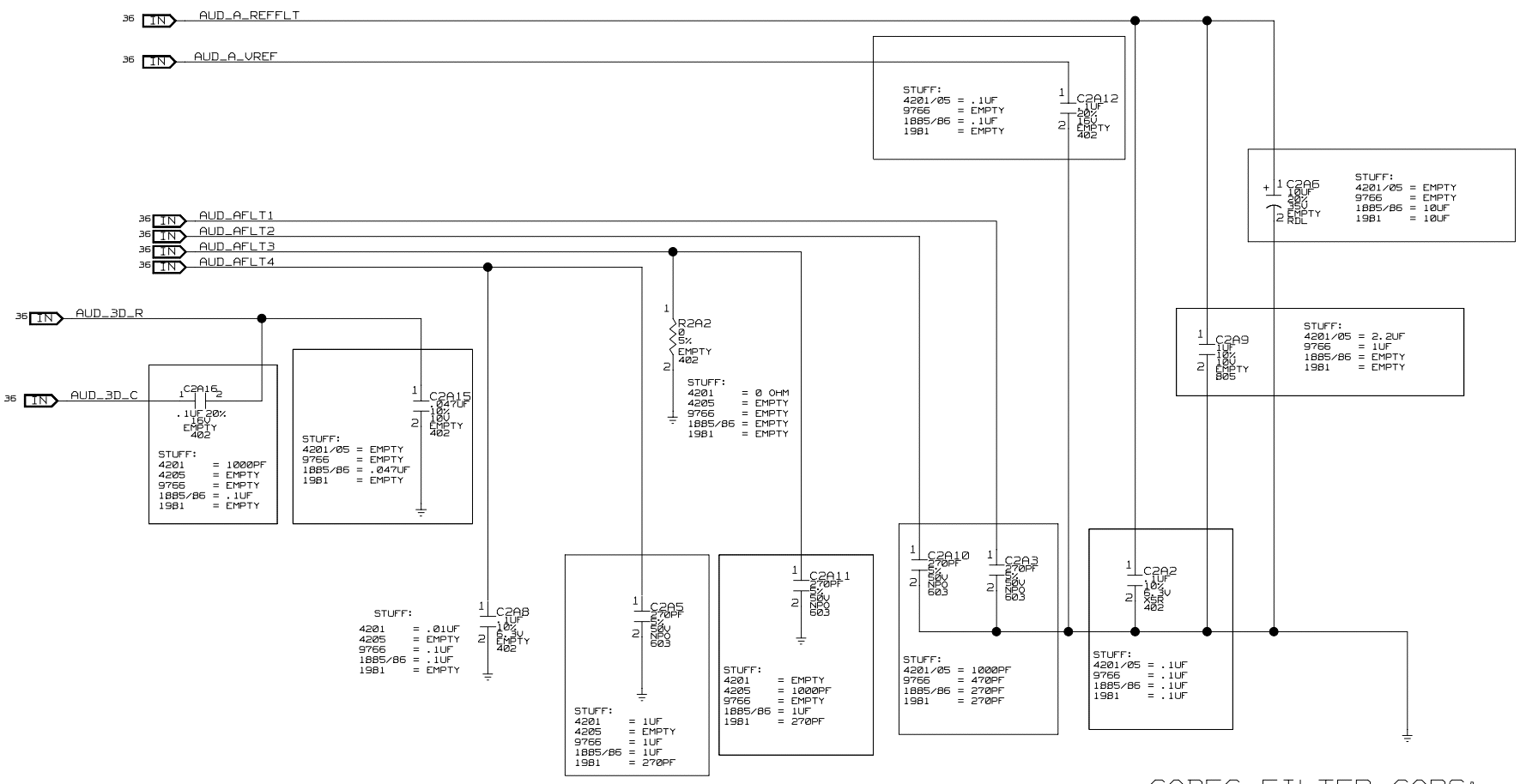
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	34	D



INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	35	D


AUD_LINK_SDO_CDC
AUD_LINK_SYNC_CDC
AUD_LINK_RST*
STUFF FOR CS4201 SUPPORT WITHOUT 24.576 XTAL
PLACE CAREFULLY / NO STUBS
FOR PLL MODE ONLY
CK_14M_AUD
AUD_LINK_BCLK
AUD_LINK_SDI2
V_5P0_AUD_ANALOG
SPKR
AUD_PHONE
SPDIF_SENSE
AUD_MIC2
AUD_MIC2_IN
AUD_CODEC_ID0
AUD_CODEC_ID1
AUD_JS0
CDC_RESET*
AUD_PCBEEP_IN_STAC9708
AUD_LAUXIN
AUD_RAUXIN
AUD_CODEC_15
AUD_CODEC_17
AUD_LCD
AUD_CDGND
AUD_RCD
AUD_MIC_IN
AUD_LLINEIN
AUD_RLINEIN
AUD_3D_C
AUD_DVDD1
UNSTUFF FOR 4205_PLL ONLY
STUFF FOR 4205_PLL ONLY
VCC3
U2A2
AD1981
XTL_IN
SDATA_OUT
SYNC
RESET
ID0
ID1
EAPD
NC_12
NC_13
NC_14
NC_15
JS1
JS0
CD_L
CD_GND
CD_R
MIC1
NC_22
LINE_IN_L
LINE_IN_R
AVDD4
DVDD1
DVDD2
DVSS1
DVSS2
AVDD1
AVDD2
AVSS1
NC
NC=49
IC
XTL_OUT
BIT_CLK
SDATA_IN
SPDIF
HP_OUT_L
HP_OUT_R
LINE_OUT_L
LINE_OUT_R
MONO_OUT
REFFLT
VREFOUT
AFLT1
AFLT2
AFLT3
AFLT4
AVSS4
AVDD3
AVSS3
AVSS2
AUD_BCLK_R
AUD_LINK_SDI2_R
AUD_SPDIF
AUD_CDC_LOUT
AUD_CDC_ROUT
AUD_LINE_LOUT
AUD_LINE_ROUT
AUD_MONO_OUT
AUD_A_REFFLT
AUD_A_VREF
AUD_AFLT1
AUD_AFLT2
AUD_AFLT3
AUD_AFLT4
AUD_3D_R
AVDD3_ANALOG_R
AVSS3_GNDSTRAP
AVSS2_DCRL
STUFF FOR VV BOARD
EMPTY ON PRODUCTION BOARD
FOR NON ADI CODECS
DEFAULT STUFFING ADI 1981
SUPPORTS:
AD1885/86, AD1981,
CS4205, STAC9766
AUDIO CODEC
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
36
REV
D

KEEP CAPS AS CLOSE AS POSSIBLE TO AC97 CODEC.

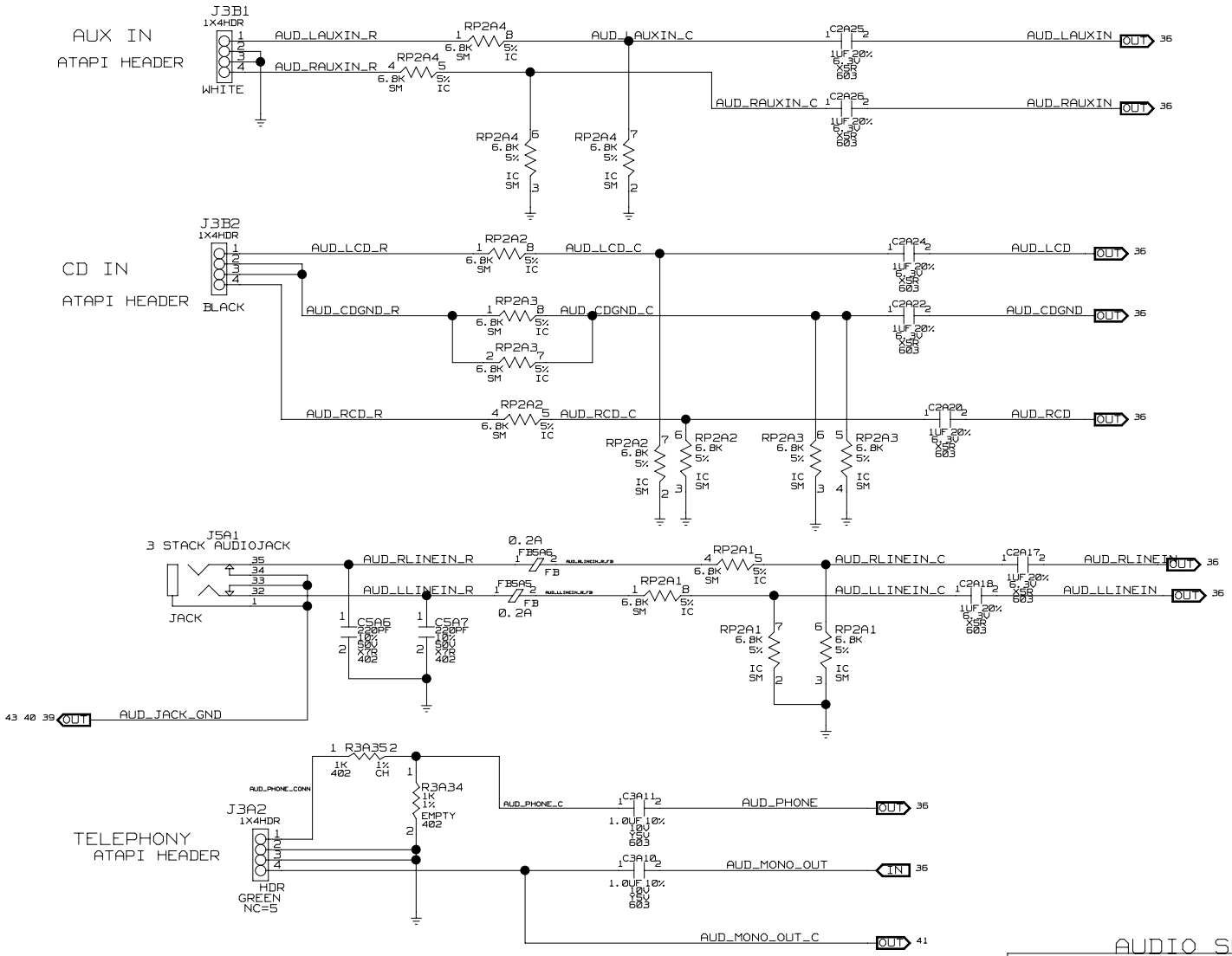


DEFAULT STUFFING ADI 1981

CODEC FILTER CAPS:
1981, 1885/86, 4205, 9766

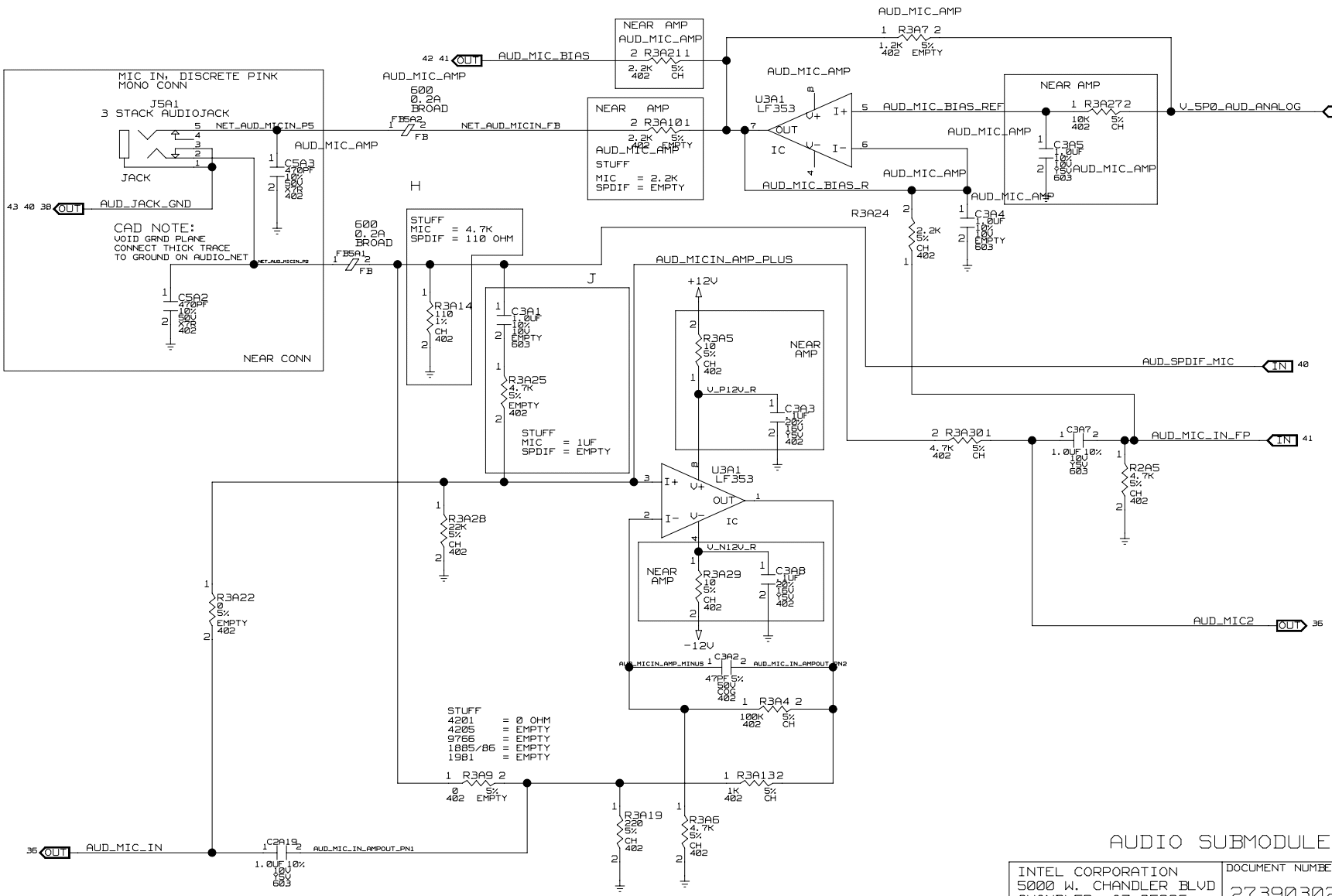
AUDIO SUBMODULE 2

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	37	D



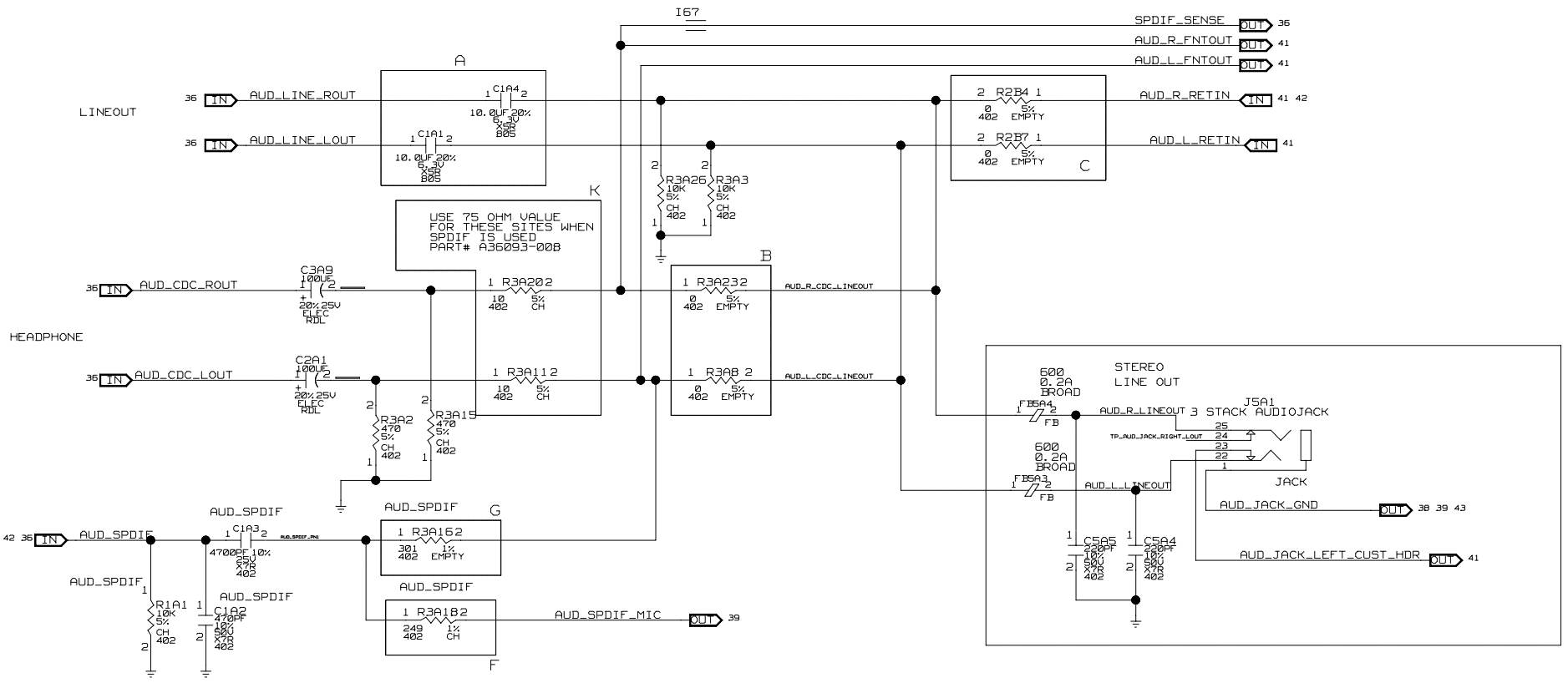
AUDIO SUBMODULE 5

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER 27390302	PAGE 38	REV D



AUDIO SUBMODULE 4

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	39	D



	BP ONLY	FP--> BP
HEADPHONE	STUFF B EMPTY A, C	STUFF C EMPTY A, B
LINEOUT	STUFF A EMPTY B, C	N/A

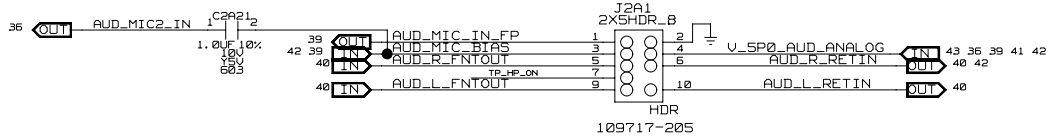
SPDIF	BP LO	BP MIC
F	EMPTY	STUFF
G	STUFF	EMPTY
H	EMPTY	110 OHM
J	STUFF	EMPTY
K	75 OHM	10 OHM

AUDIO SUBMODULE 3

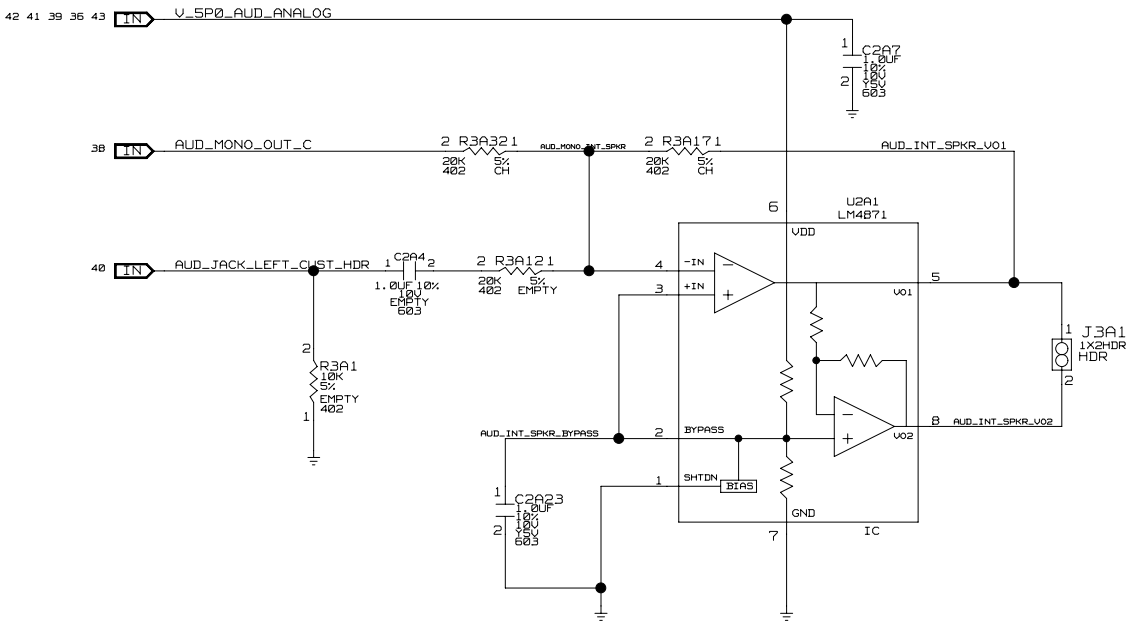
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	40	D

NOTE:
FP DONGLE MUST HAVE
MIC JACK RING SHUNT SPRING
TERMINAL CONNECTED
TO GND FOR PROPER
MIC SENSING OPERATION

PLACE NEAR AUDIO CIRCUIT



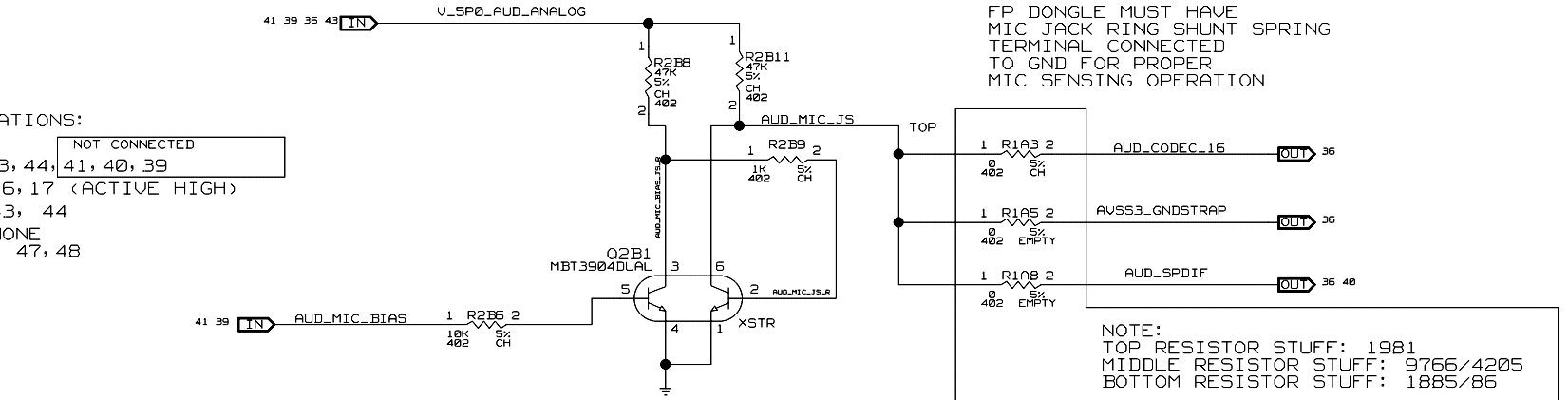
INTERNAL SPEAKER CIRCUIT



AUDIO FRONT PANEL

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	41	D

MIC JACK SENSE

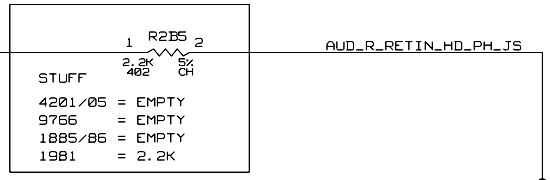


NOTE:
FP DONGLE MUST HAVE
MIC JACK RING SHUNT SPRING
TERMINAL CONNECTED
TO GND FOR PROPER
MIC SENSING OPERATION

GPIO LOCATIONS:

NOT CONNECTED	
4205:	43, 44, 41, 40, 39
1981:	16, 17 (ACTIVE HIGH)
9766:	43, 44
4291:	NONE
1885/86:	47, 48

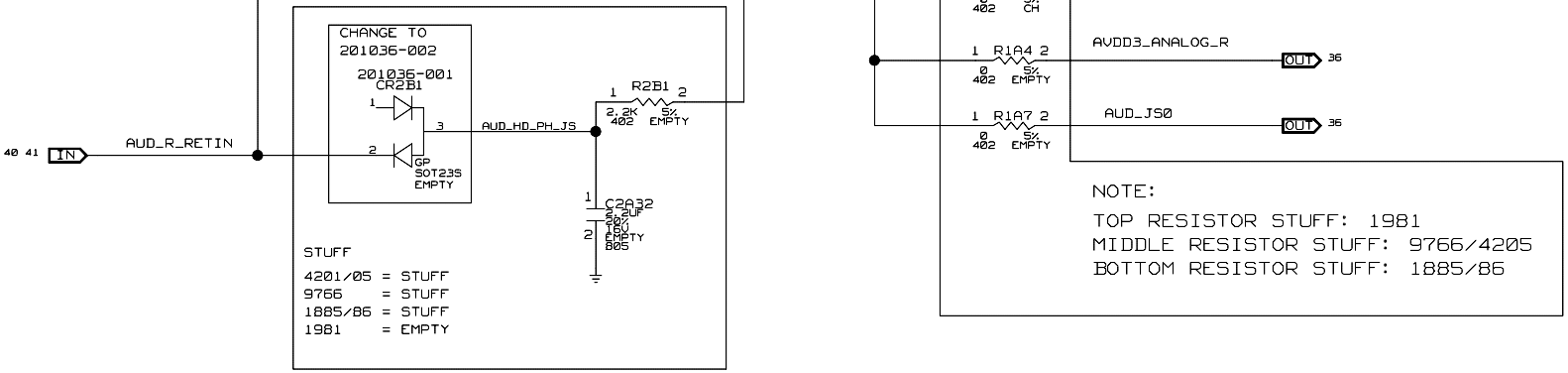
NOTE:
TOP RESISTOR STUFF: 1981
MIDDLE RESISTOR STUFF: 9766/4205
BOTTOM RESISTOR STUFF: 1885/86



STUFF

4201/05	= EMPTY
9766	= EMPTY
1885/86	= EMPTY
1981	= 2.2K

HEADPHONE JACK SENSE



STUFF

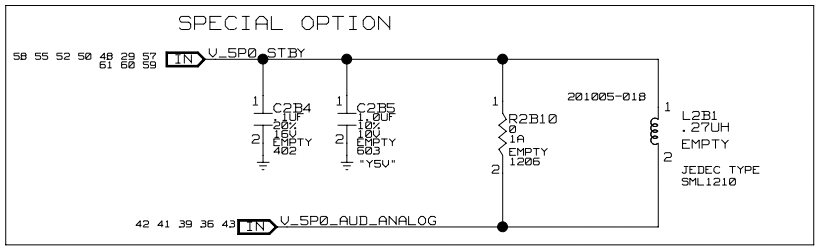
4201/05	= STUFF
9766	= STUFF
1885/86	= STUFF
1981	= EMPTY

NOTE:
TOP RESISTOR STUFF: 1981
MIDDLE RESISTOR STUFF: 9766/4205
BOTTOM RESISTOR STUFF: 1885/86

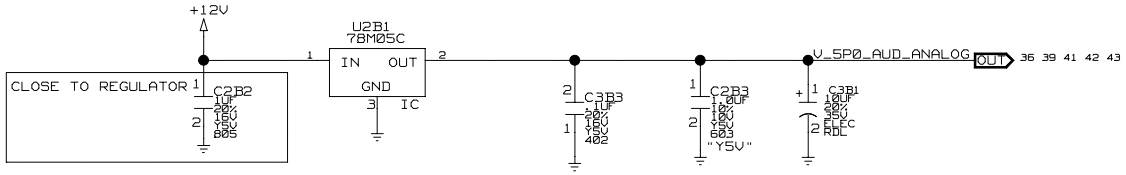
DEFAULT
STUFFING
ADI 1981

MIC/HEADPHONE

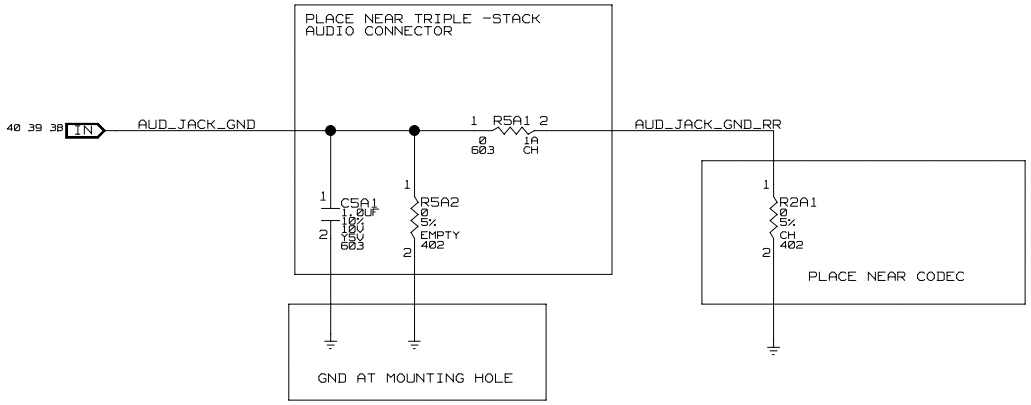
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	42	D



REGULATOR THERMAL TAB SHOULD BE SOLDERED TO A COPPER PAD THAT IS LARGE ENOUGH TO ALLOW 5 TO 10 GROUND VIAS AROUND THE COMPONENT FOR COOLING

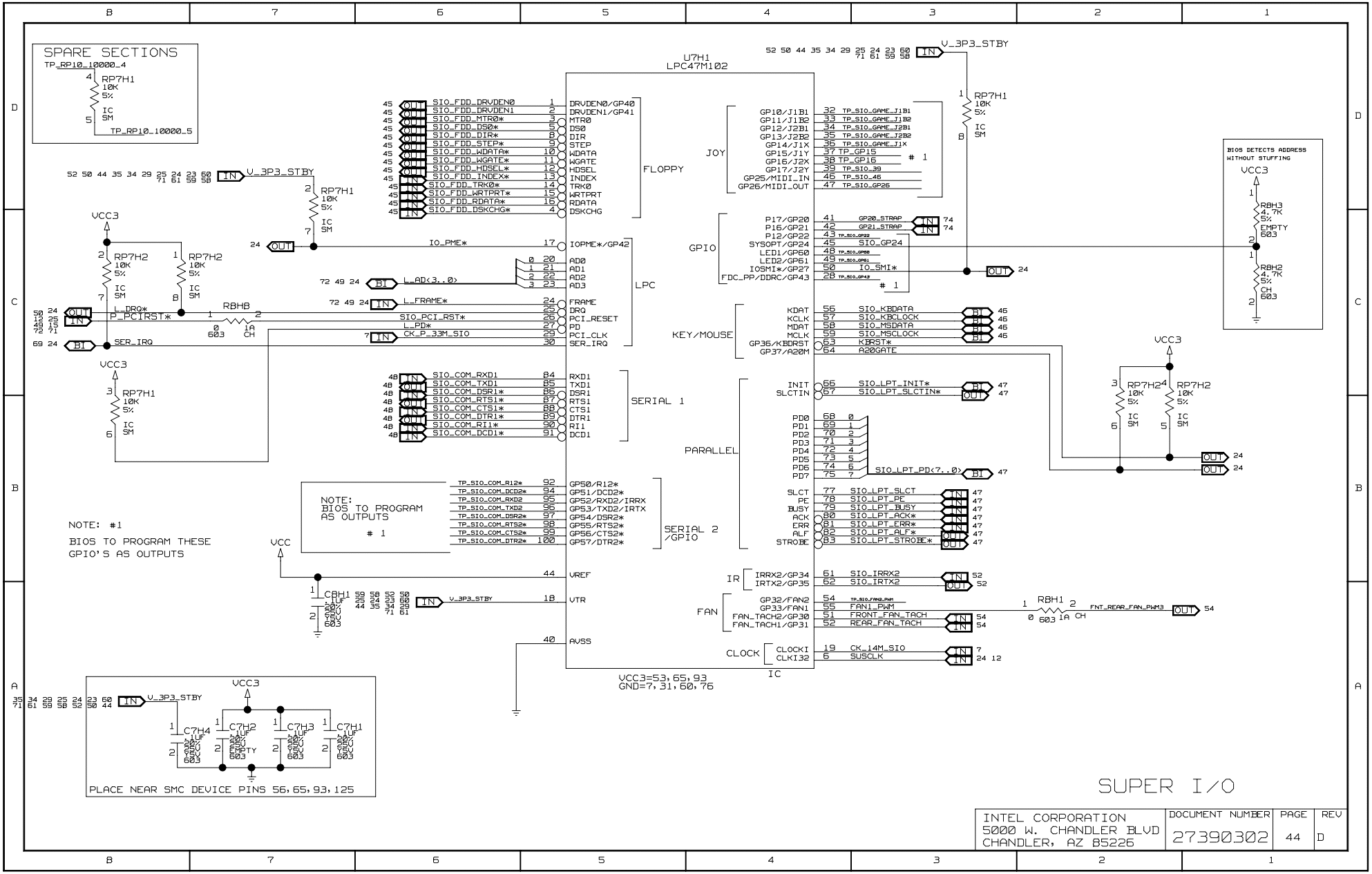


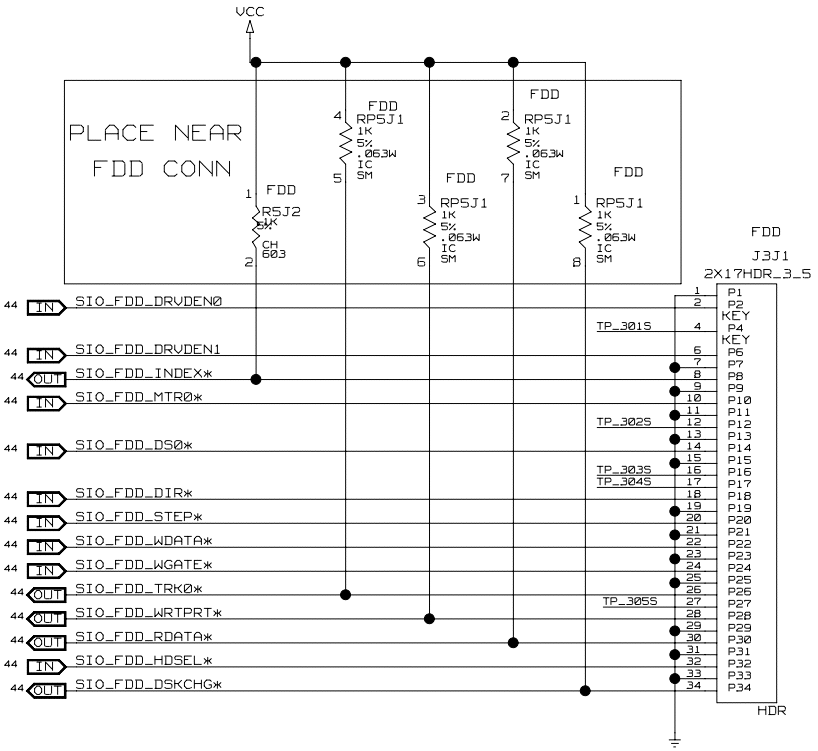
NOTE:
LAYOUT SHOULD GO FROM PIN 2 TO CAPS AND THEN THROUGH SEVERAL VIAS TO V_5P0_AUD_ANALOG



AUDIO VREG

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	43	D

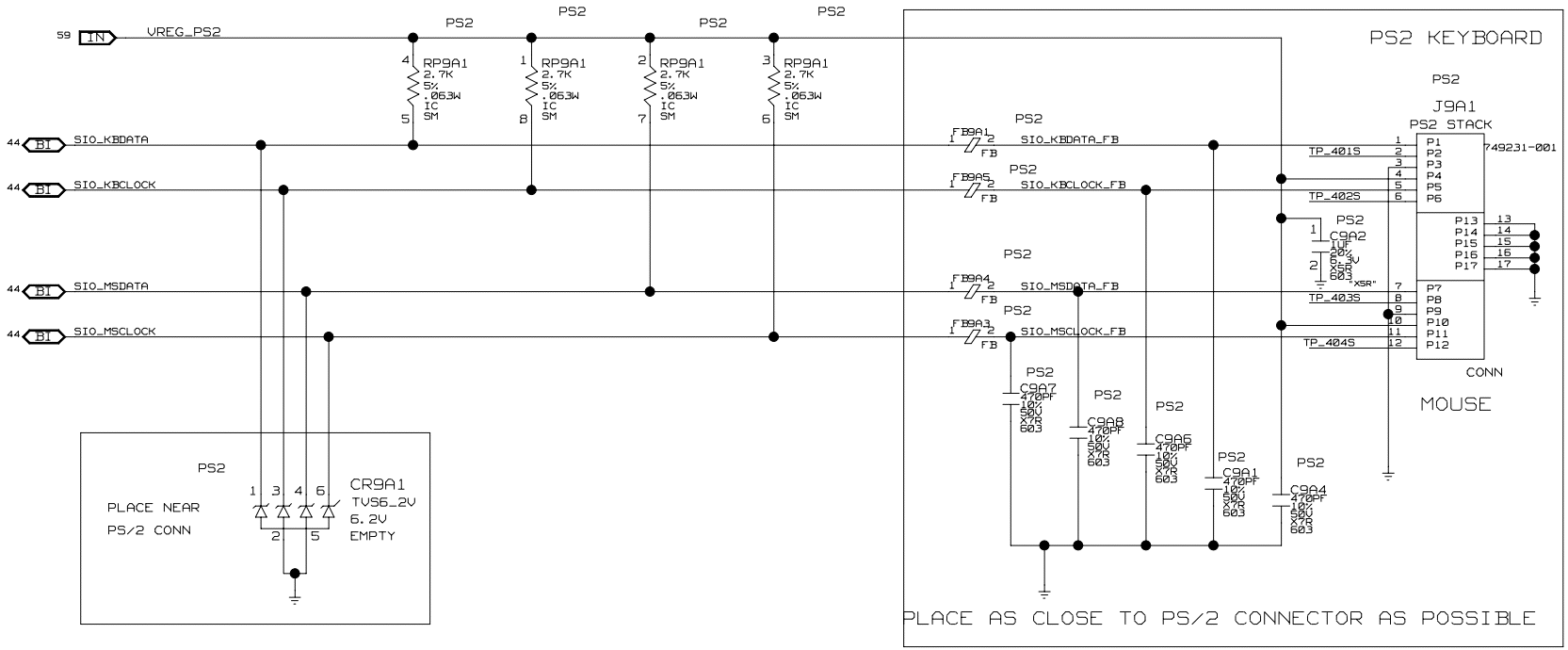

SPARE SECTIONS
TP_RP10_10000_4
RP7H1
10K
5%
IC
SM
TP_RP10_10000_5
U7H1
LPC47M102
V_3P3_STBY
FLOPPY
SIO_FDD_DRVDEN0
SIO_FDD_DRVDEN1
SIO_FDD_MTR0*
SIO_FDD_DS0*
SIO_FDD_DIR*
SIO_FDD_STEP*
SIO_FDD_WDATA*
SIO_FDD_WGATE*
SIO_FDD_HDSEL*
SIO_FDD_INDEX*
SIO_FDD_TRK0*
SIO_FDD_WRTPRT*
SIO_FDD_RDATA*
SIO_FDD_DSKCHG*
DRVDEN0/GP40
DRVDEN1/GP41
MTR0
DS0
DIR
STEP
WDATA
WGATE
HDSEL
INDEX
TRK0
WRTPRT
RDATA
DSKCHG
JOY
GP10/J1B1
GP11/J1B2
GP12/J2B1
GP13/J2B2
GP14/J1X
GP15/J1Y
GP16/J2X
GP17/J2Y
GP25/MIDI_IN
GP26/MIDI_OUT
GPIO
P17/GP20
P16/GP21
P12/GP22
SYSOPT/GP24
LED1/GP60
LED2/GP61
IOSMI*/GP27
FDC_PP/DDRC/GP43
IO_SMI*
LPC
IO_PME*
IOPME*/GP42
AD0
AD1
AD2
AD3
L_AD<3..0>
L_FRAME*
L_DRQ*
P_PCIRST*
L_PD*
CK_P_33M_SIO
SER_IRQ
FRAME
DRQ
PCI_RESET
PD
PCI_CLK
SERIAL_IRQ
KEY/MOUSE
KDAT
KCLK
MDAT
MCLK
KBRST*
A20GATE
SIO_KBDATA
SIO_KBCLOCK
SIO_MSDATA
SIO_MSCLOCK
SERIAL 1
SIO_COM_RXD1
SIO_COM_TXD1
SIO_COM_DSR1*
SIO_COM_RTS1*
SIO_COM_CTS1*
SIO_COM_DTR1*
SIO_COM_RI1*
SIO_COM_DCD1*
RXD1
TXD1
DSR1
RTS1
CTS1
DTR1
RI1
DCD1
PARALLEL
INIT
SLCTIN
PD0
PD1
PD2
PD3
PD4
PD5
PD6
PD7
SLCT
PE
BUSY
ACK
ERR
ALF
STROBE*
SIO_LPT_INIT*
SIO_LPT_SLCTIN*
SIO_LPT_PD<7..0>
SIO_LPT_SLCT
SIO_LPT_PE
SIO_LPT_BUSY
SIO_LPT_ACK*
SIO_LPT_ERR*
SIO_LPT_ALF*
SIO_LPT_STROBE*
SERIAL 2 /GPIO
GP50/R12*
GP51/DCD2*
GP52/RXD2/IRRX
GP53/TXD2/IRTX
GP54/DSR2*
GP55/RTS2*
GP56/CTS2*
GP57/DTR2*
IR
IRRX2/GP34
IRTX2/GP35
SIO_IRRX2
SIO_IRTX2
FAN
GP32/FAN2
GP33/FAN1
FAN_TACH2/GP30
FAN_TACH1/GP31
FAN1_PWM
FRONT_FAN_TACH
REAR_FAN_TACH
FNT_REAR_FAN_PWM3
CLOCK
CLKI
CLKI32
CK_14M_SIO
SUSCLK
VREF
VTR
AVSS
VCC3=53, 65, 93
GND=7, 31, 60, 76
IC
NOTE:
BIOS TO PROGRAM
AS OUTPUTS
1
NOTE: #1
BIOS TO PROGRAM THESE
GPIO'S AS OUTPUTS
BIOS DETECTS ADDRESS
WITHOUT STUFFING
RBH3
4.7K
EMPTY
603
RBH2
4.7K
CH
603
RBH1
RBHB
PLACE NEAR SMC DEVICE PINS 56, 65, 93, 125
C7H4
C7H2
C7H3
C7H1
C8H1
VCC3
VCC
SUPER I/O
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
44
REV
D



FLOPPY

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER 27390302	PAGE 45	REV D

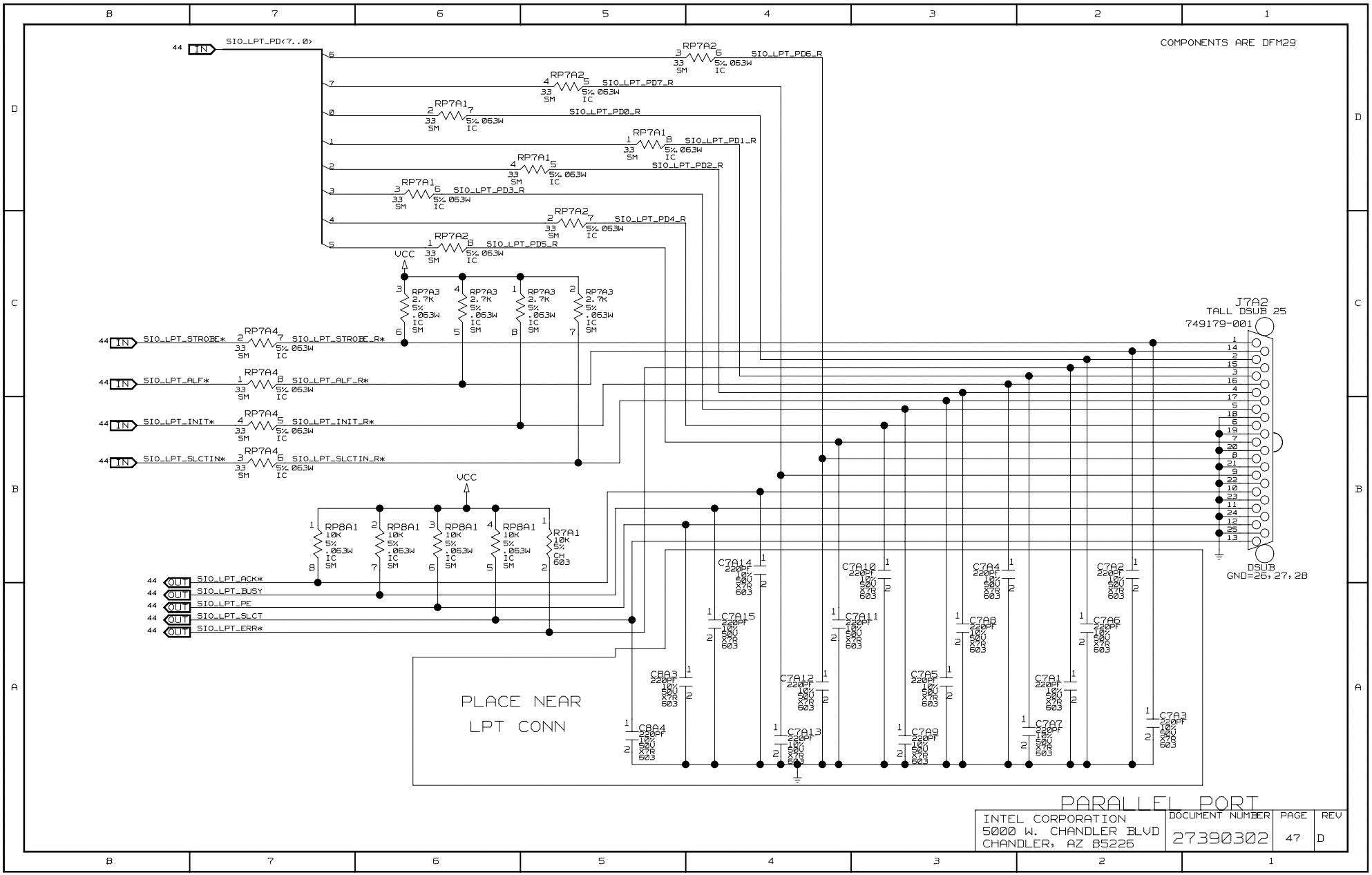
COMPONENTS ARE DFM29

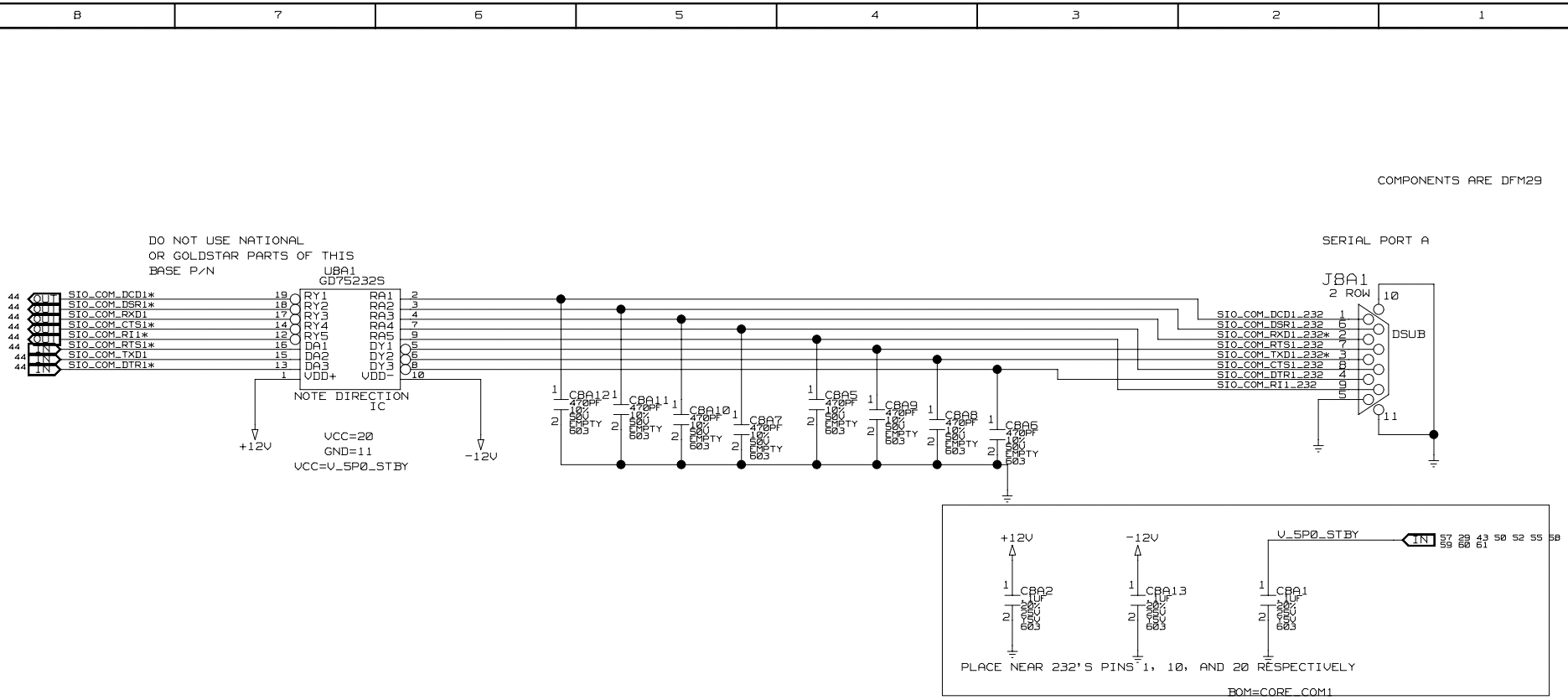


ATX DOUBLE-STACKED

PS/2 STACK

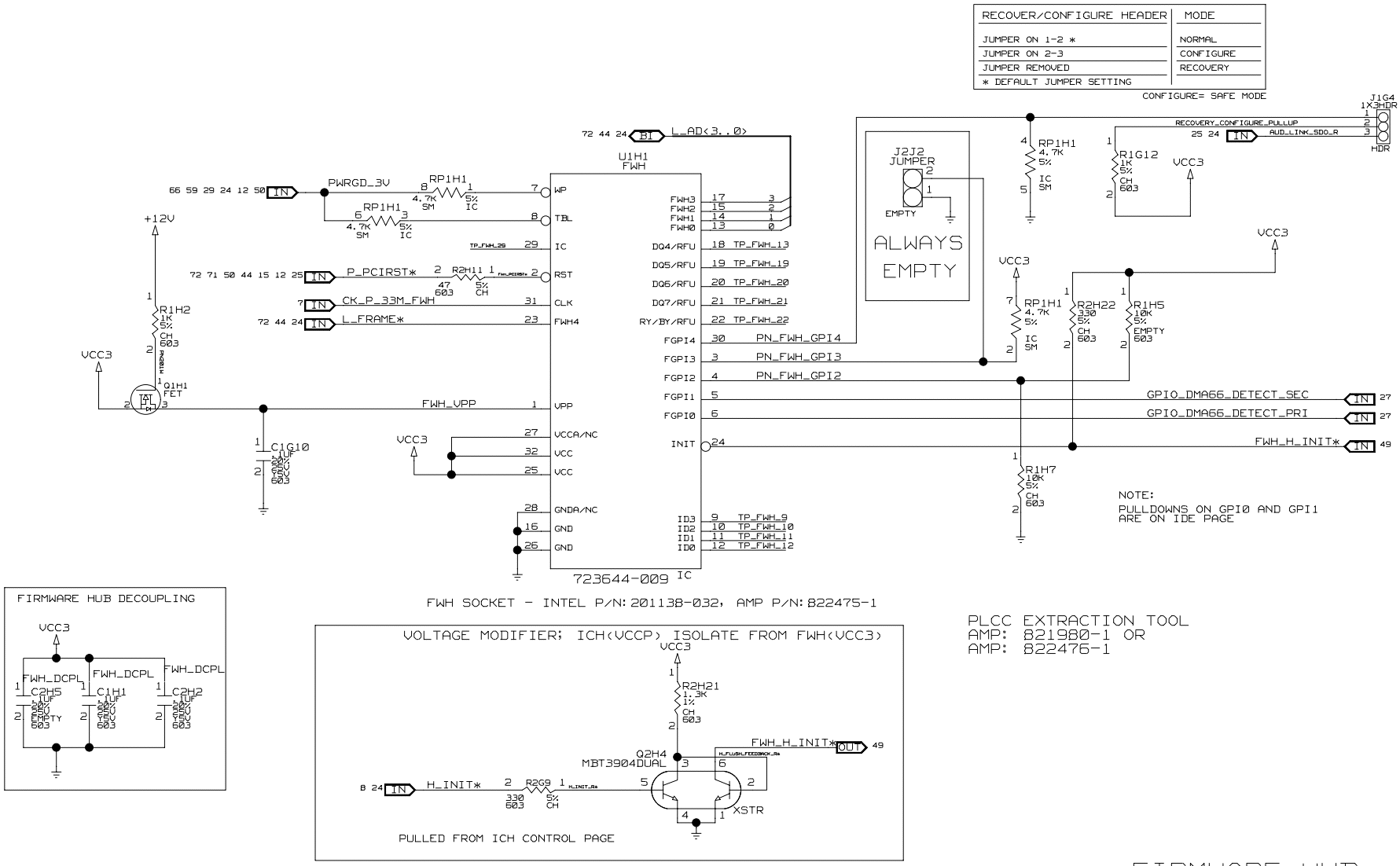
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	46	D


COMPONENTS ARE DFM29
SIO_LPT_PD<7..0>
SIO_LPT_PD6_R
SIO_LPT_PD7_R
SIO_LPT_PD0_R
SIO_LPT_PD1_R
SIO_LPT_PD2_R
SIO_LPT_PD3_R
SIO_LPT_PD4_R
SIO_LPT_PD5_R
VCC
SIO_LPT_STROBE*
SIO_LPT_ALF*
SIO_LPT_INIT*
SIO_LPT_SLCTIN*
SIO_LPT_ACK*
SIO_LPT_BUSY
SIO_LPT_PE
SIO_LPT_SLCT
SIO_LPT_ERR*
J7A2
TALL DSUB 25
749179-001
DSUB
GND=25, 27, 28
PLACE NEAR
LPT CONN
PARALLEL PORT
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
47
REV
D



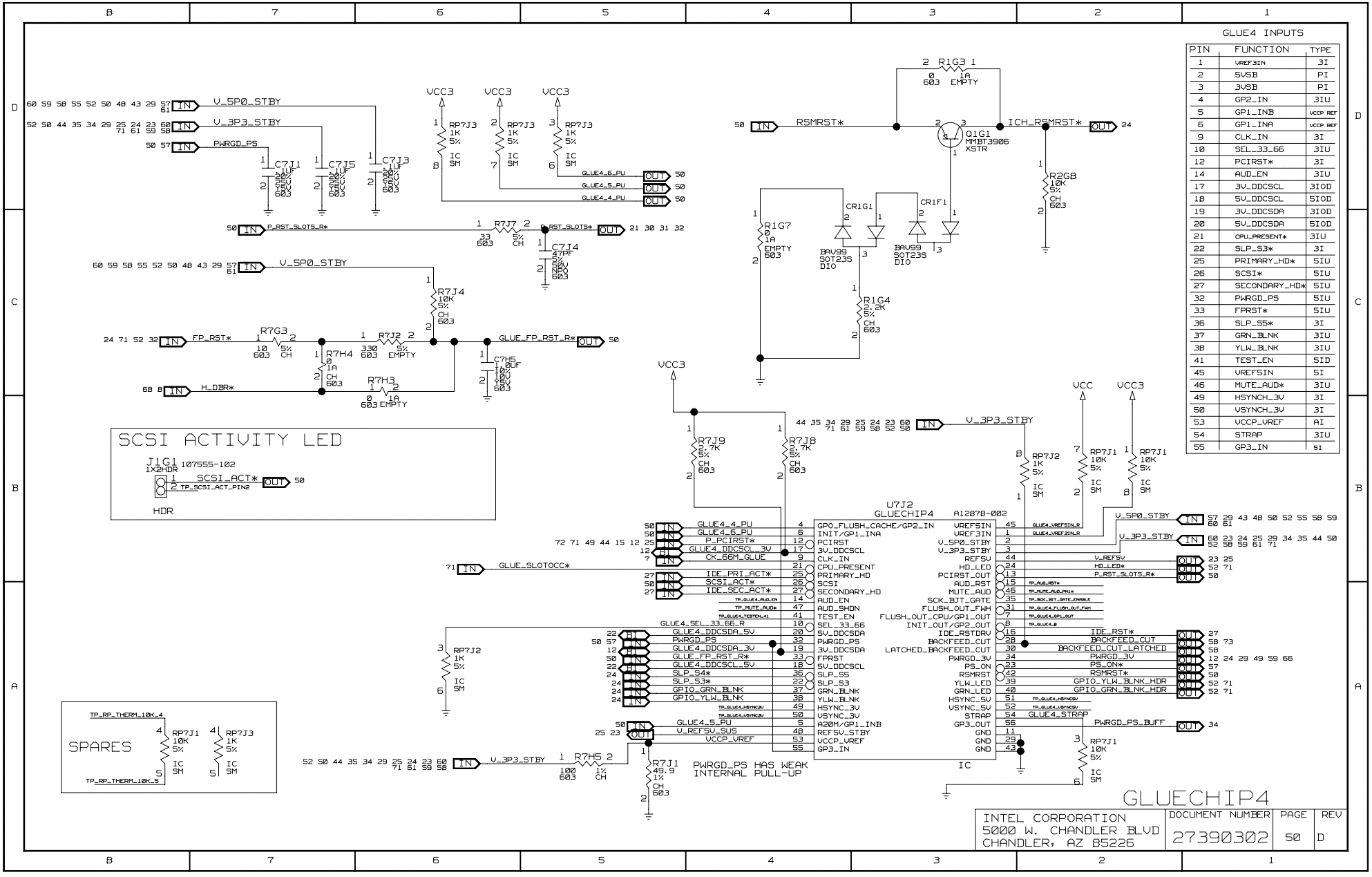
SERIAL PORT

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	48	D

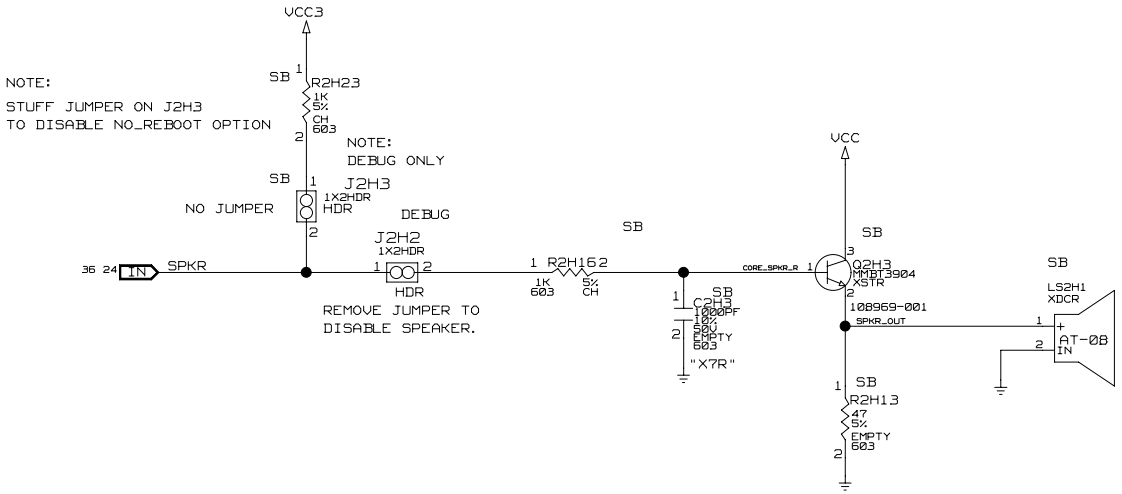


FIRMWARE HUB

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER 27390302	PAGE 49	REV D

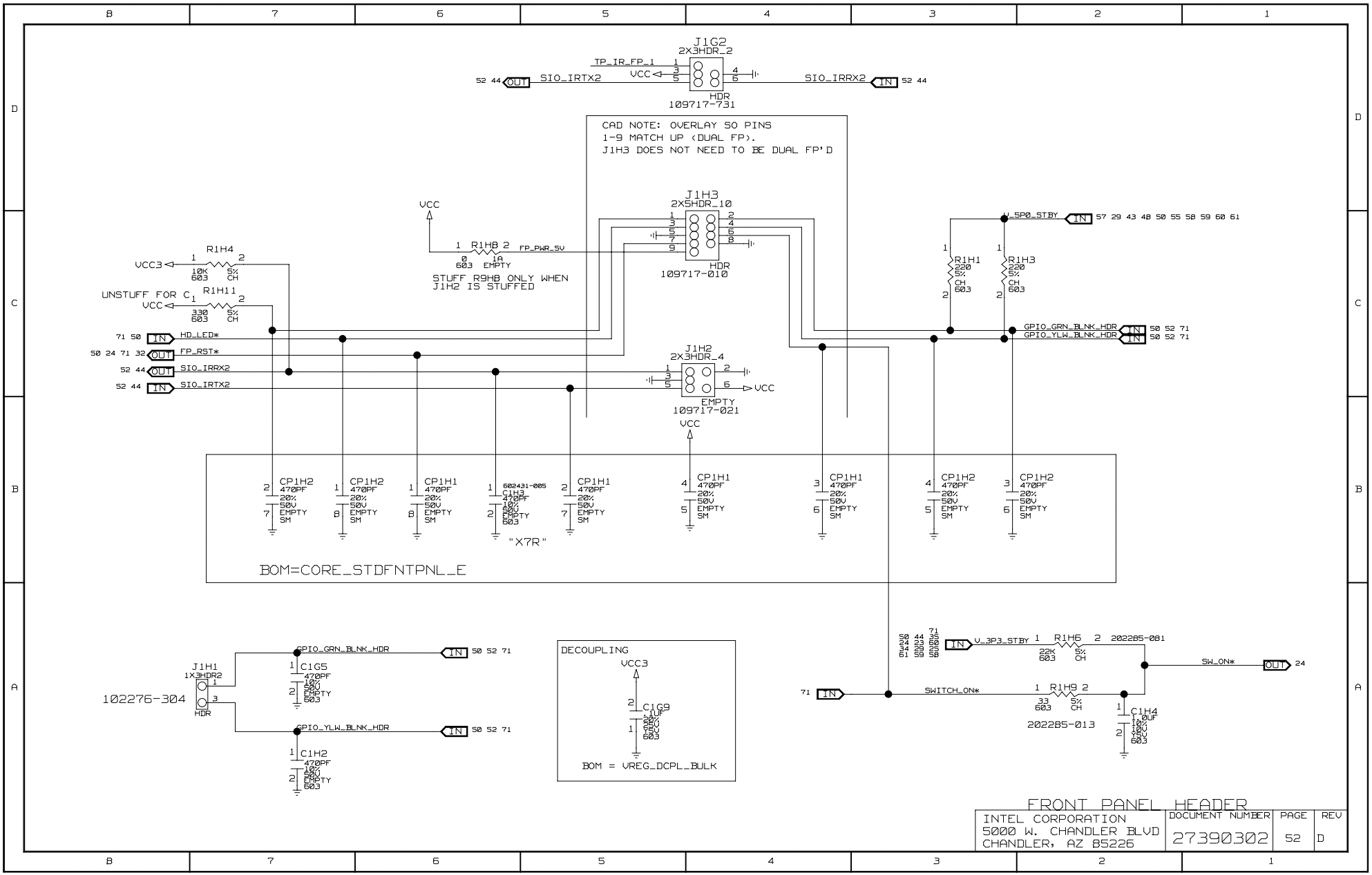


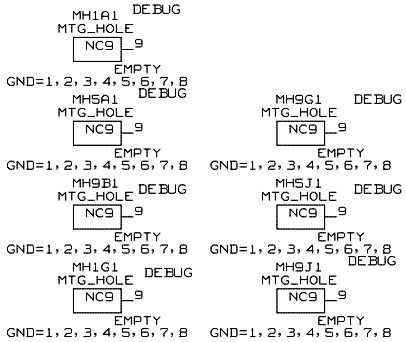
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	50	D



SPEAKER

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	51	D


J1G2
2X3HDR_2
TP_IR_FP_1
VCC
SIO_IRTX2
SIO_IRRX2
HDR
109717-731
CAD NOTE: OVERLAY SO PINS
1-9 MATCH UP (DUAL FP).
J1H3 DOES NOT NEED TO BE DUAL FP'D
J1H3
2X5HDR_10
HDR
109717-010
R1H8
FP_PWR_5V
STUFF R9H8 ONLY WHEN
J1H2 IS STUFFED
R1H4
10K
R1H11
UNSTUFF FOR C
330
HD_LED*
FP_RST*
SIO_IRRX2
SIO_IRTX2
J1H2
2X3HDR_4
EMPTY
109717-021
V_5P0_STBY
R1H1
R1H3
220
GPIO_GRN_BLNK_HDR
GPIO_YLW_BLNK_HDR
CP1H2
CP1H1
470PF
20%
50V
EMPTY
SM
602431-005
C1H3
"X7R"
BOM=CORE_STDFNTPNL_E
J1H1
1X3HDR2
102276-304
HDR
C1G5
C1H2
DECOUPLING
VCC3
C1G9
1UF
BOM = VREG_DCPL_BULK
V_3P3_STBY
R1H5
202285-081
22K
SW_ON*
SWITCH_ON*
R1H9
33
202285-013
C1H4
FRONT PANEL HEADER
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
52
REV
D



CONNECTOR LOCATION		
	X	Y
PS/2	8525	6210
USB/LAN	7965	5927
COM	6940	6115
PAR	5362	5843
VGA	5136	6190
DIAGLED	4636	6045
USB	4151	6026
AUD	3291	6218

LABELS

DEBUG
LBBH1
SILK
1
INTELtm

'INTEL' LOGO SILKSCREEN
2.0 X 0.250
MAKE EMPTY ON BOM

LB9J1
LABEL
→

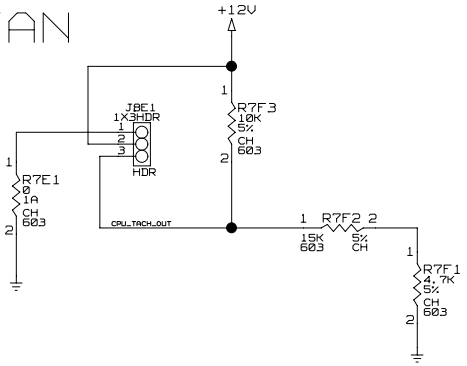
A19177-001
1375X250_TARGET

MOUNTING HOLES & LABELS

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	53	D

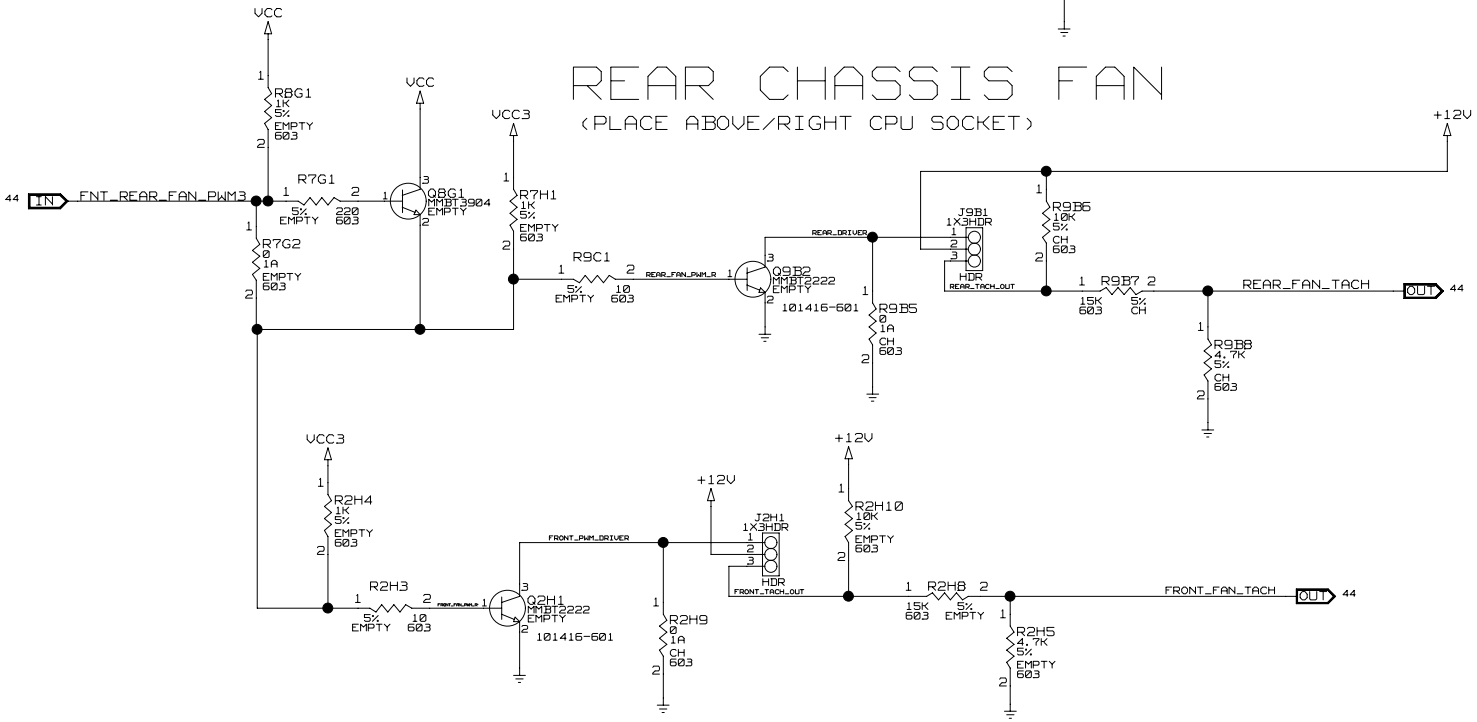
CPU ALWAYS-ON FAN

(PLACE BELOW/RIGHT CPU SOCKET)



REAR CHASSIS FAN

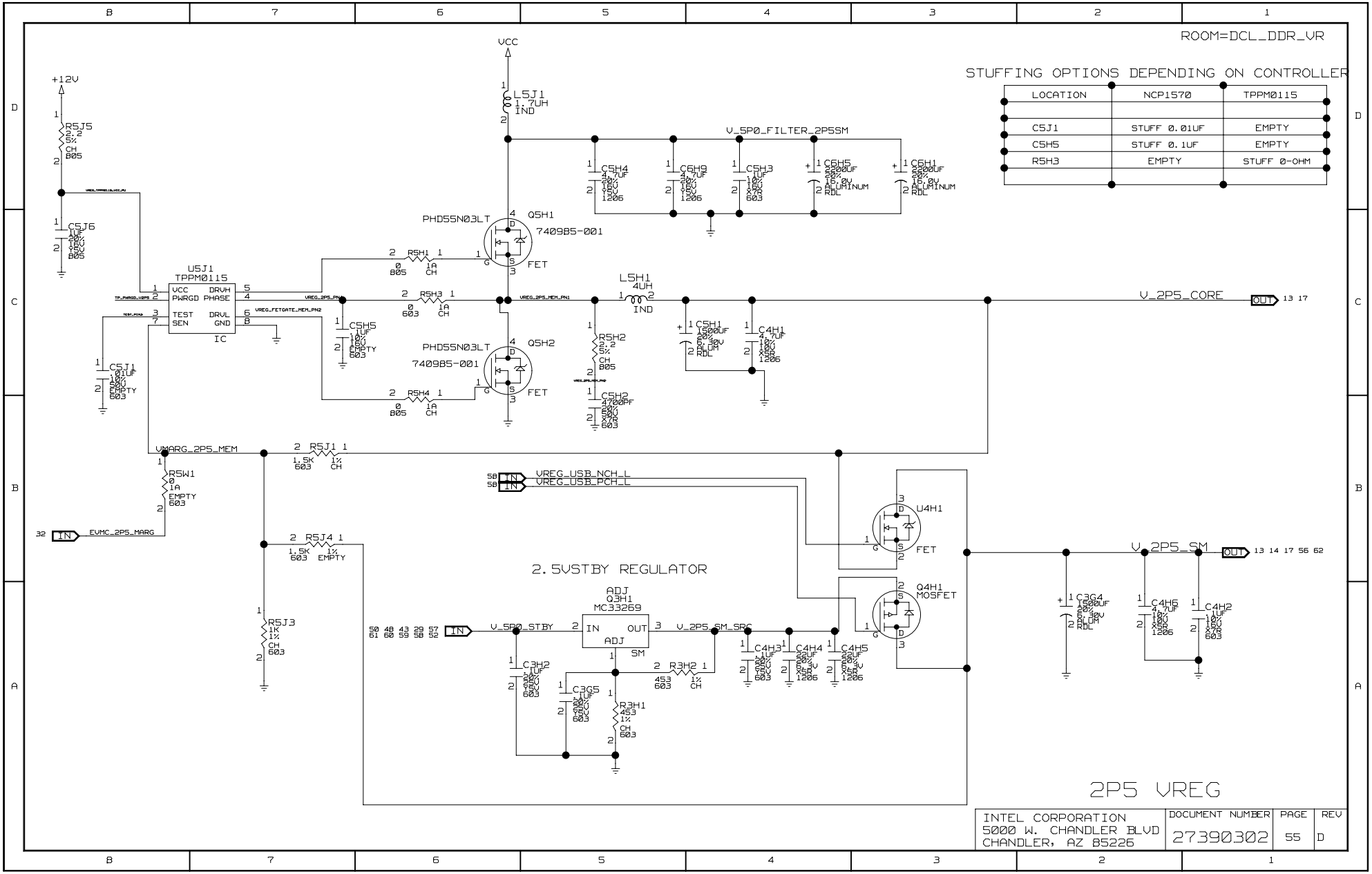
(PLACE ABOVE/RIGHT CPU SOCKET)



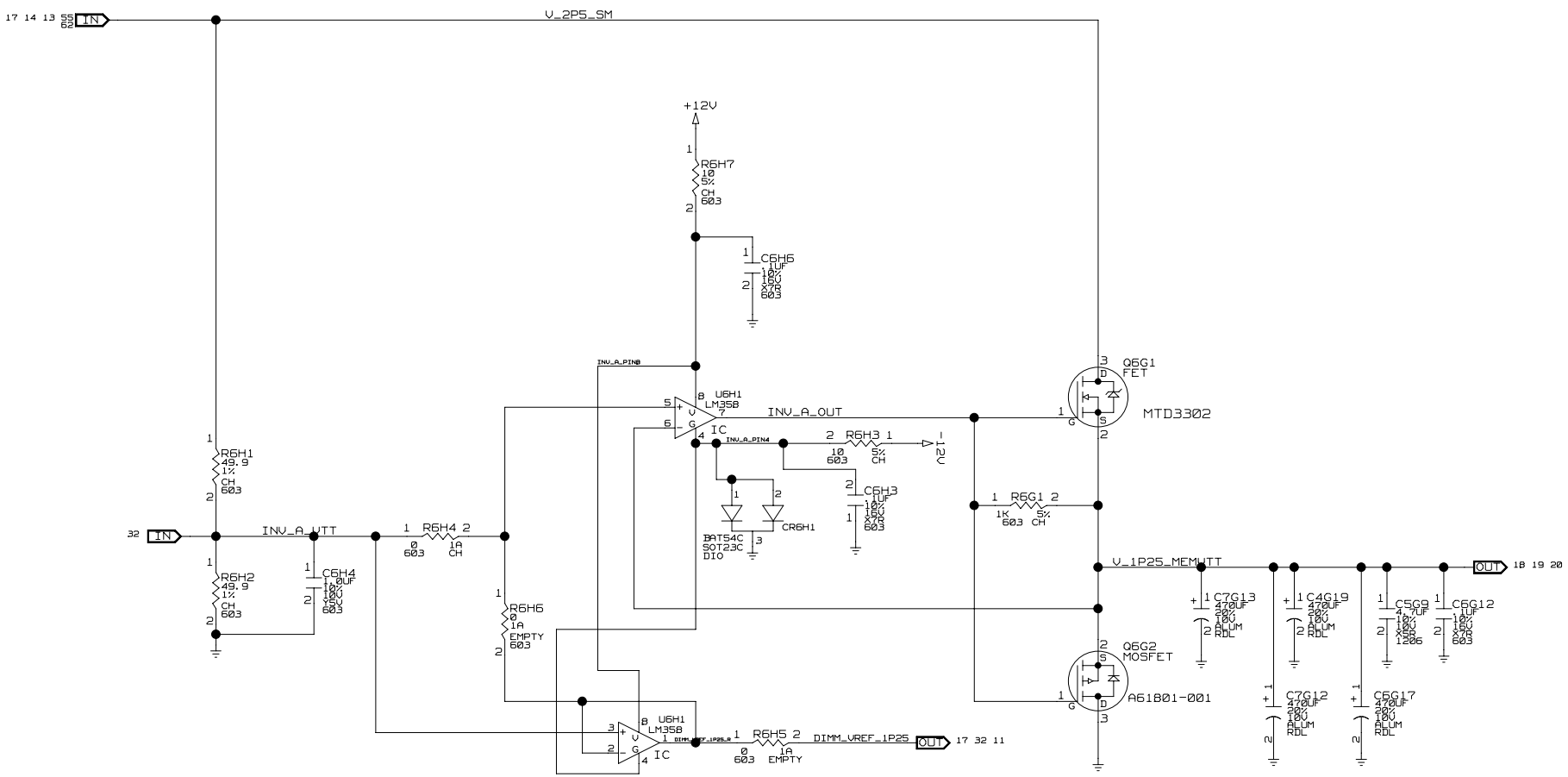
(PLACE LOWER LEFT CORNER OF PLATFORM)

CPU & CHASSIS FANS

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	54	D

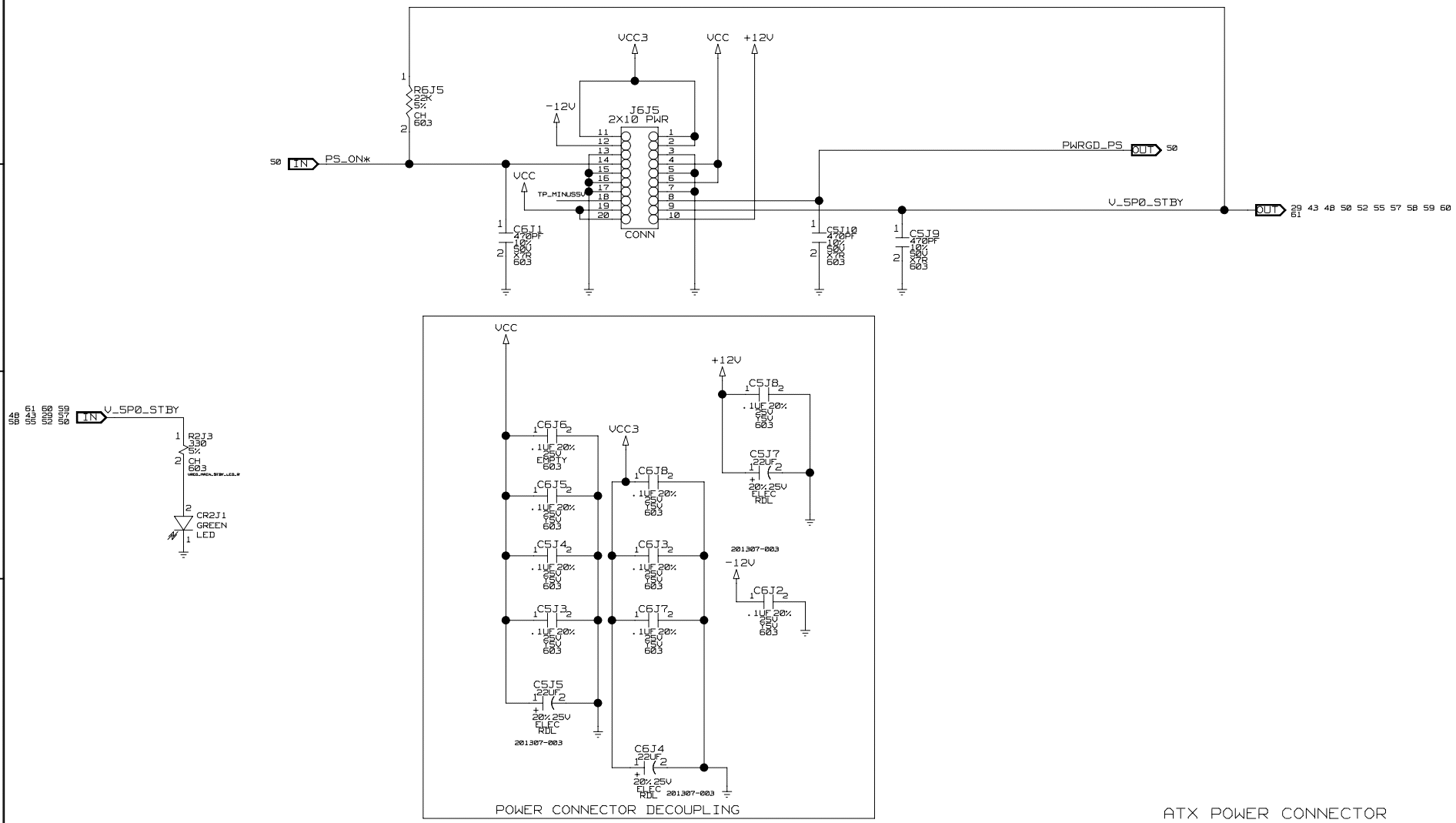

ROOM=DCL_DDR_VR
STUFFING OPTIONS DEPENDING ON CONTROLLER
LOCATION | NCP1570 | TPPM0115
C5J1 | STUFF 0.01UF | EMPTY
C5H5 | STUFF 0.1UF | EMPTY
R5H3 | EMPTY | STUFF 0-OHM
+12V
VCC
L5J1 1.7UH IND
V_5P0_FILTER_2P5SM
PHD55N03LT
Q5H1
740985-001
FET
U5J1
TPPM0115
IC
VCC DRVH PWRGD PHASE TEST DRVL SEN GND
L5H1 4UH IND
V_2P5_CORE
OUT 13 17
PHD55N03LT
Q5H2
740985-001
VMARG_2P5_MEM
R5SW1
EMPTY
EVMC_2P5_MARG
VREG_USB_NCH_L
VREG_USB_PCH_L
U4H1
FET
2.5VSTBY REGULATOR
ADJ
Q3H1
MC33269
IN OUT ADJ
V_5P0_STBY
V_2P5_SM_SPC
Q4H1
MOSFET
V_2P5_SM
OUT 13 14 17 56 62
2P5 VREG
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER 27390302
PAGE 55
REV D

ROOM=DCL_DDR_VR



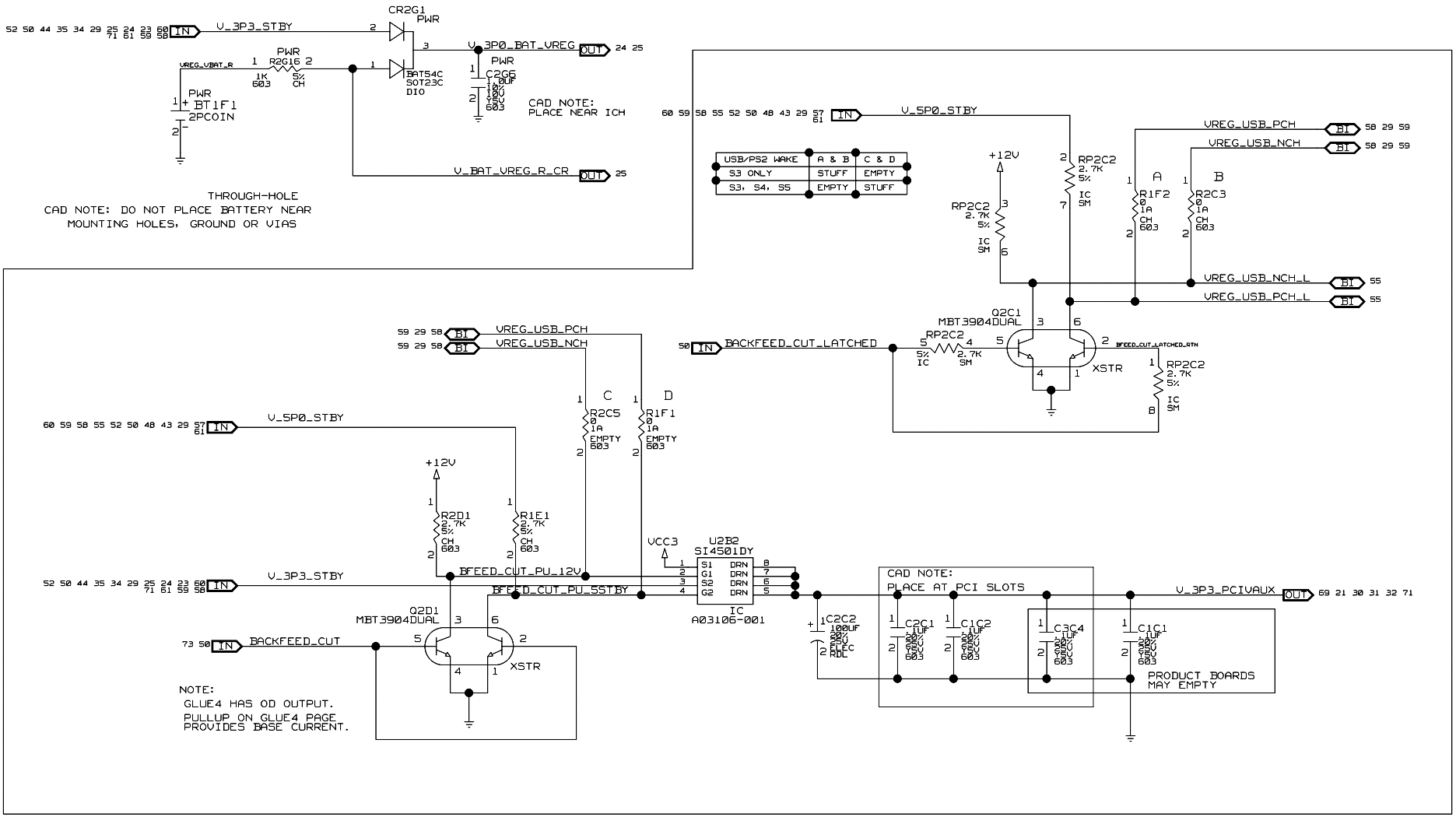
1.25V DDR

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	56	D



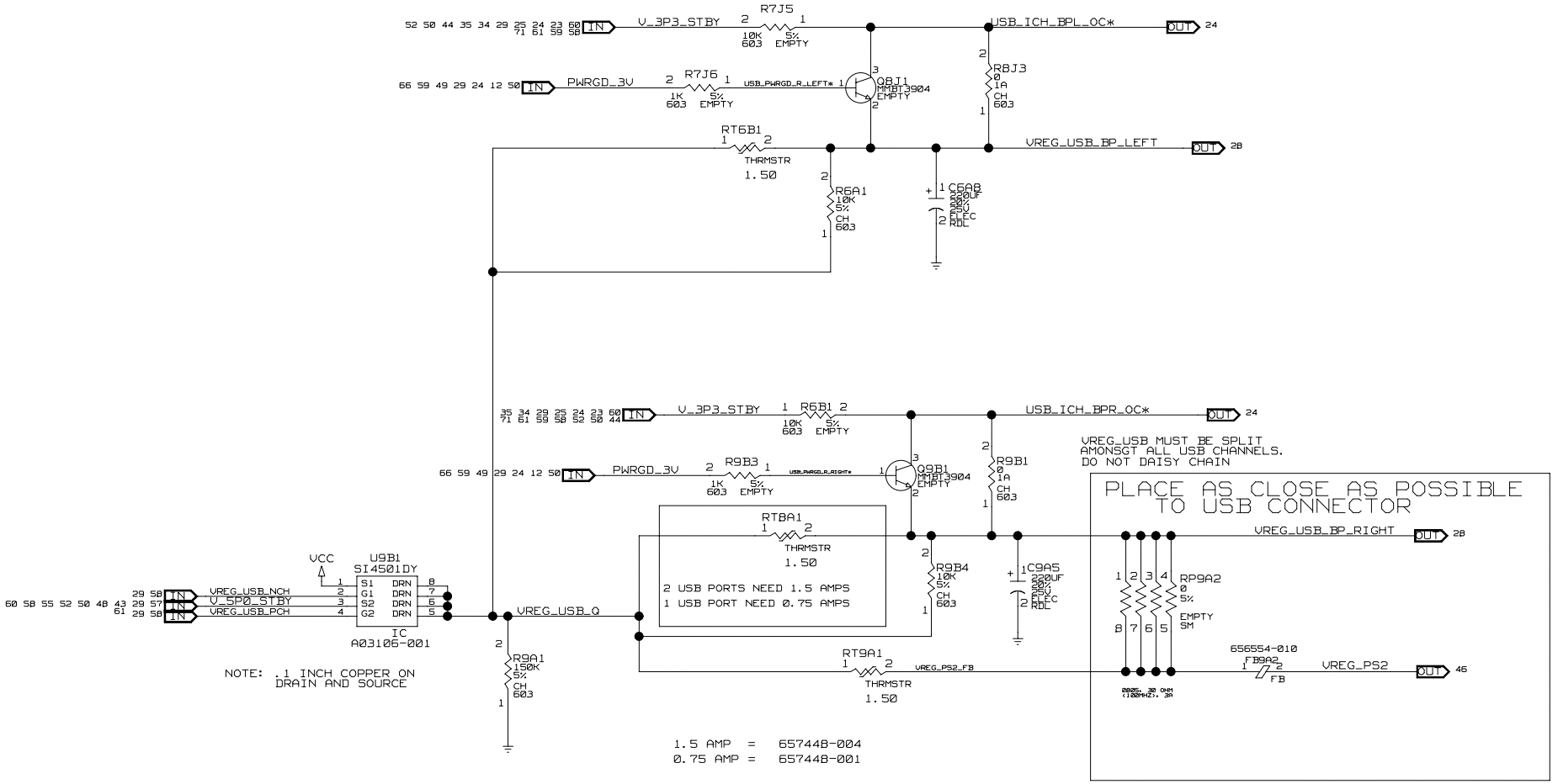
ATX POWER CONNECTOR

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	57	D



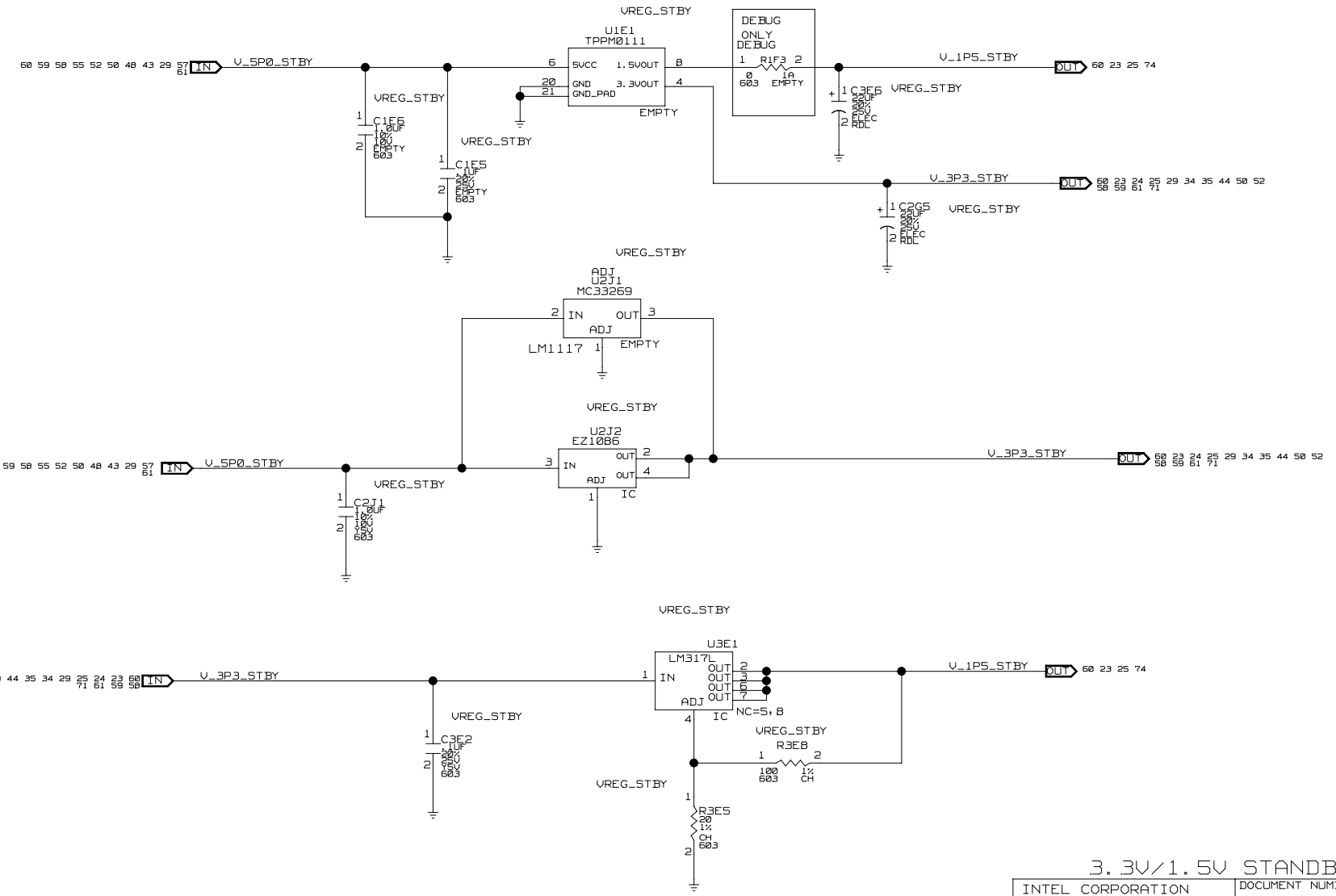
PCI VAUX

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	58	D



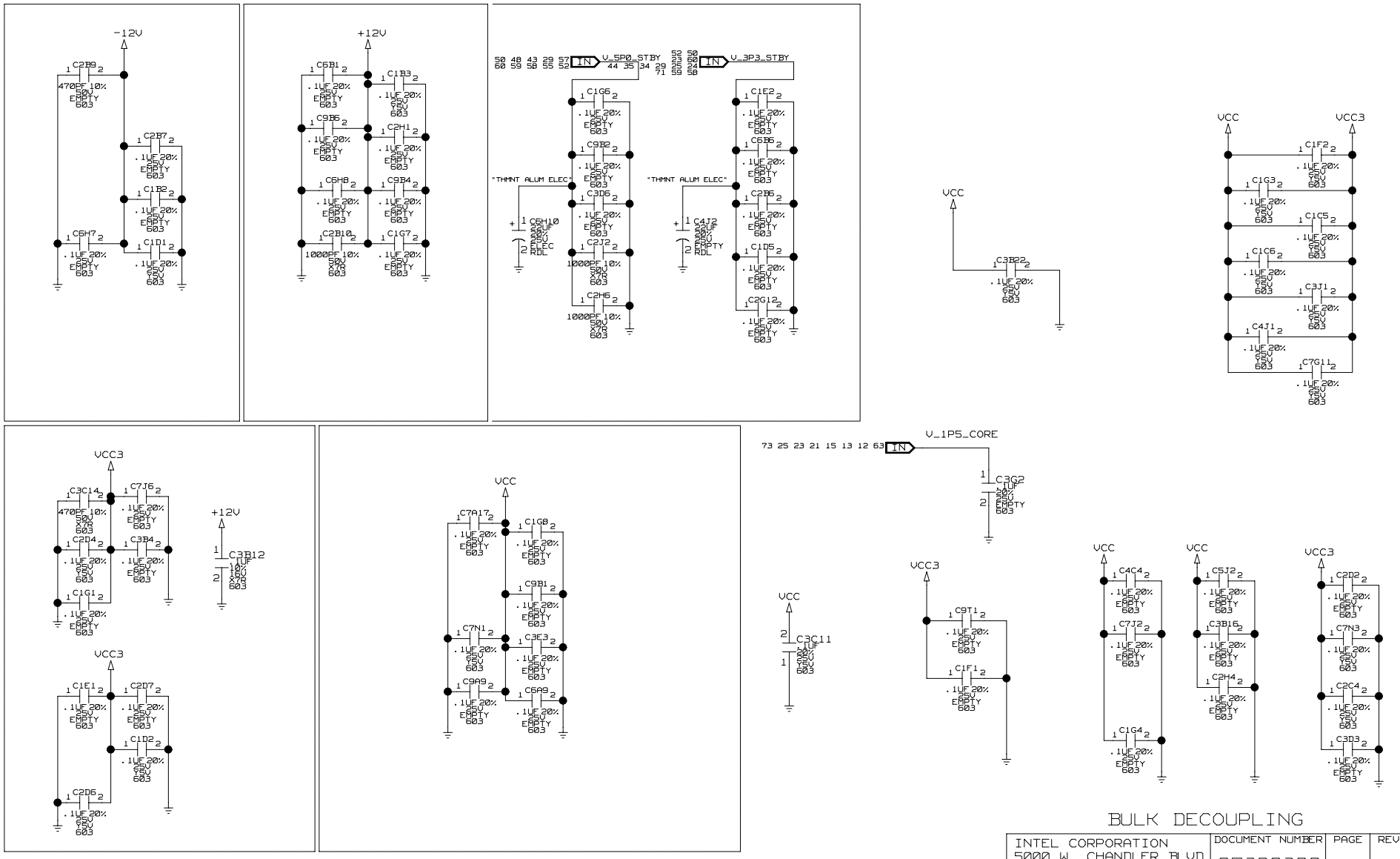
WAKE ON USB & PS2

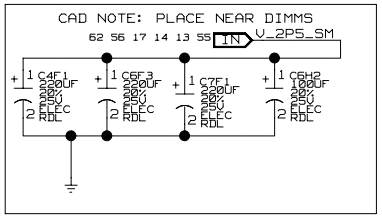
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	59	D

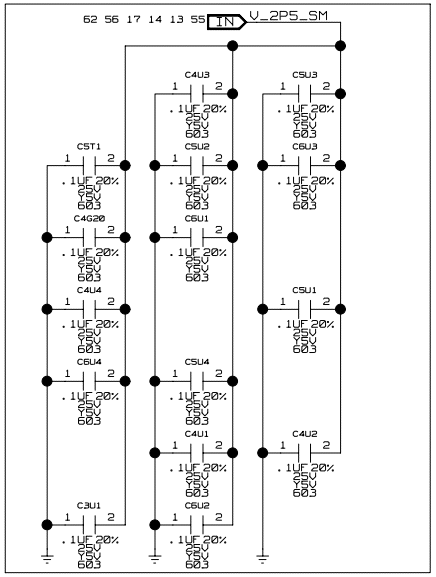


3.3V/1.5V STANDBY

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	60	D

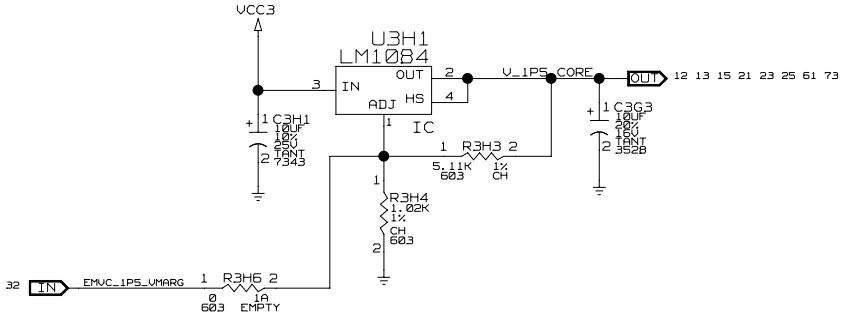

-12V
+12V
V_5P0_STBY
V_3P3_STBY
"THMNT ALUM ELEC"
VCC
VCC3
V_1P5_CORE
BULK DECOUPLING
INTEL CORPORATION
5000 W. CHANDLER BLVD
CHANDLER, AZ 85226
DOCUMENT NUMBER
27390302
PAGE
61
REV
D





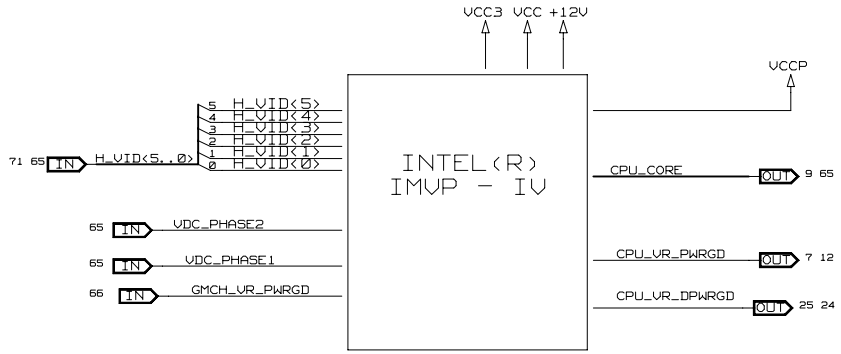
DDR 2P5_SM DECOUPLING

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	62	D



1.5V REGULATOR

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER 27390302	PAGE 63	REV D



CPU VREG

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER 27390302	PAGE 64	REV D

ROOM = DCL_CORE_CPU_VREG

MID FREQUENCY CPU DECOUPLING

9 64 IN CPU_CORE

C3P3 C3P2 C3P1 C2P6 C2P5 C2P4 C2P3 C2P2 C3N1 C2P7 C3P11 C3P10 C3P9 C2P21 C2P20
C2P19 C2P18 C2P17 C3N6 C2P16 C2P8 C2P15 C2P12 C2P11 C3N7 C2N1 C3N4 C3N3 C3N2 C2N5 C2N6 C2N4 C2N3 C2N2 C3N5

10.0UF 20% 6.3V X5R 0805

BULK CPU DECOUPLING

C8C1 C7C3 C7C4 C8C2
330UF 20% 2.5V TANT 7343

VCCP

VCCP CPU DECOUPLING

C3P4 C3P6 C3P5 C3P8 C3P7 C2P13 C2P9 C2P1 C2P14 C2P10 C2P11 C7D2 C7D3
1UF 5% 16V X7R 603
150UF 20% 4V POSCAP 7343
150UF 20% 4V EMPTY 7343

PLACE ON BOTTOM OF CPU UNDER BANIAS SOCKET CAVITY

CPU VR FET DRAIN VOLTAGE

+12V

R9B2 2 — 0.002 2512 5% CH — VDC_PHASE1 — OUT 64

C9B3 C9B5 C9C1 C9B7 C9C2
10UF 20% 25V X5R 1210

+12V

R7B2 2 — 0.002 2512 5% CH — VDC_PHASE2 — OUT 64

C7B11 C7B9 C7C1 C7B12 C7C2
10UF 20% 25V X5R 1210

64 71 OUT

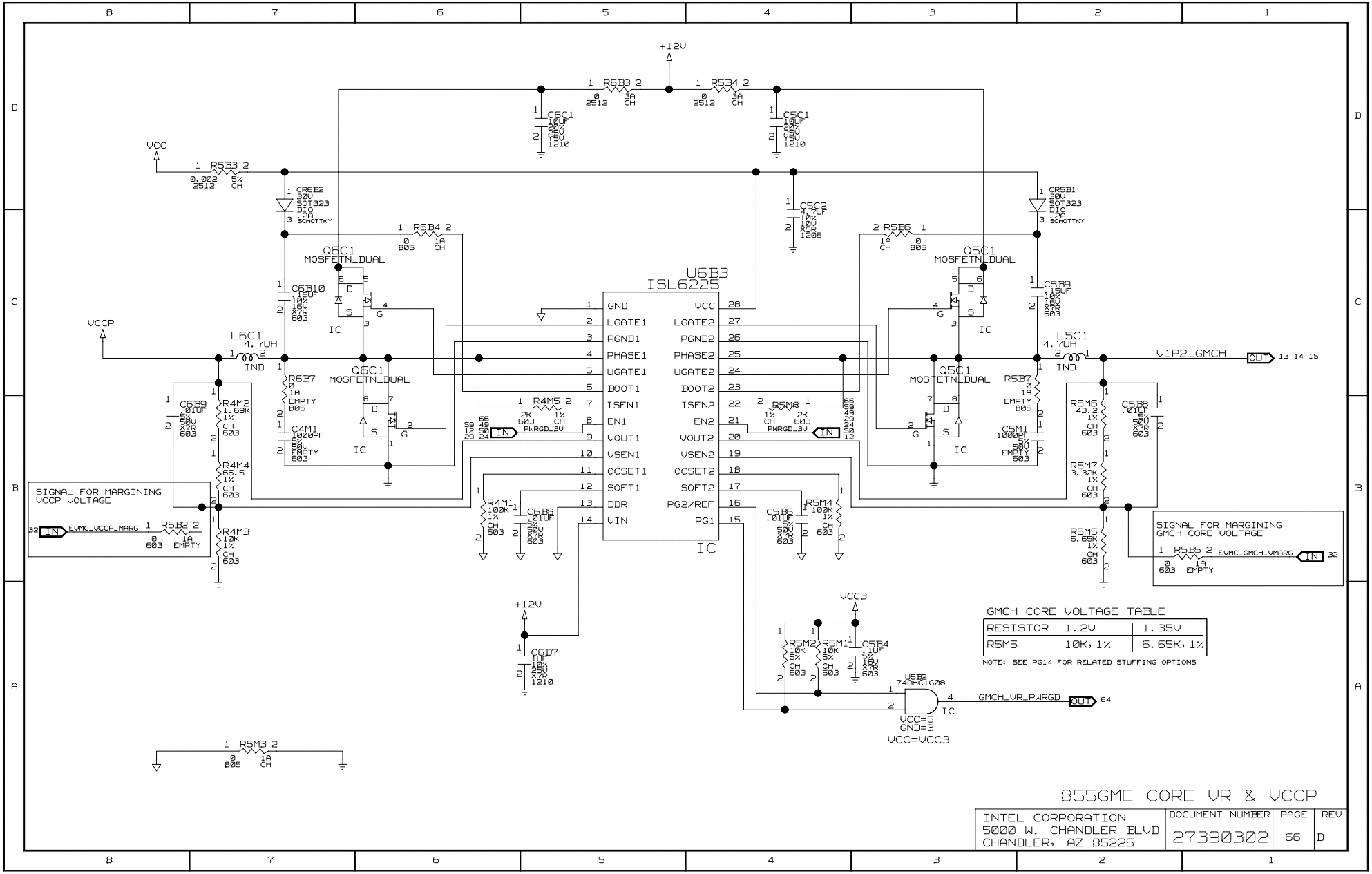
H_VID<0> R9D3 2
H_VID<1> R9D1 2
H_VID<2> R9C9 2
H_VID<3> R9C6 2
H_VID<4> R9C4 2
H_VID<5> R9C2 2

1K 603 5% CH

VCCP

CPU DECOUPLING

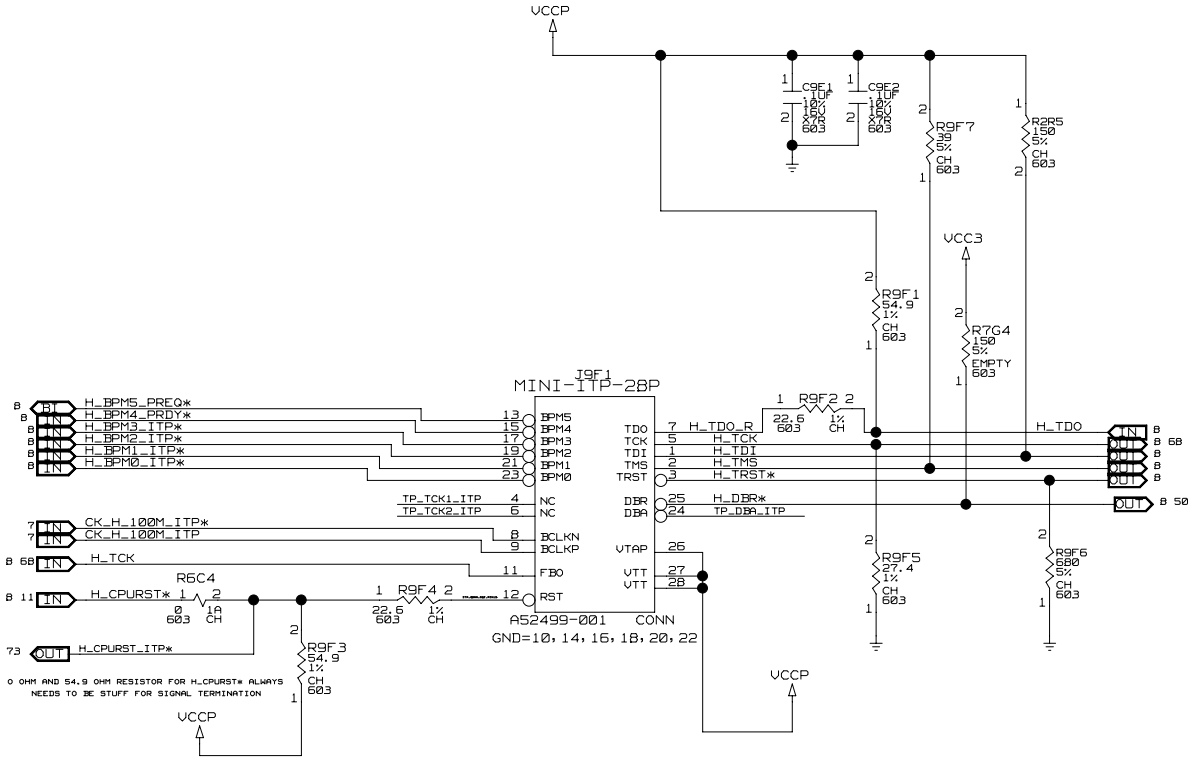
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	65	D



855GME CORE VR & VCCP

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	66	D

DEBUG PAGES

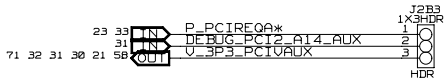


CAD NOTE: ROUTE H_TCK FROM THE TCK PIN OF THE CONNECTOR TO THE PROCESSOR PIN. FBO LENGTH = TCK + BPM LENGTHS TO CPU.

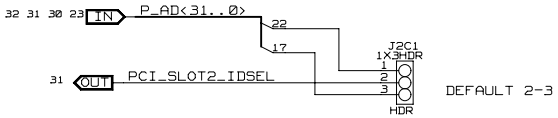
SEE ROUTING GUIDELINES FOR LENGTH MATCHING REQUIREMENTS

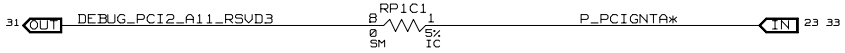
ITP 700FLEX CONNECTOR

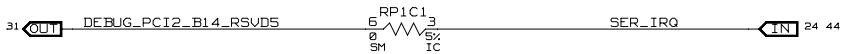
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER 27390302	PAGE 68	REV D

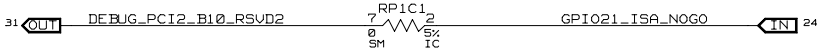


J2B3/J2C1	PCI SLOT 2 MODE
1-2	MOON ISA
2-3	PCI (DEFAULT)





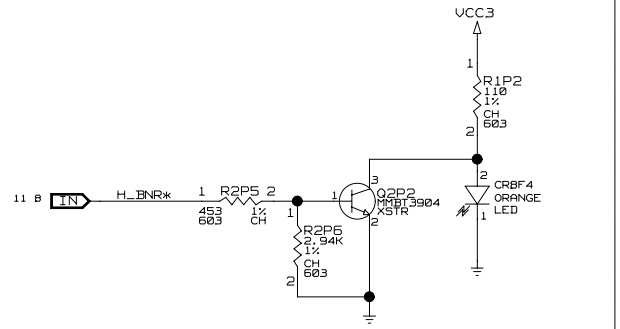




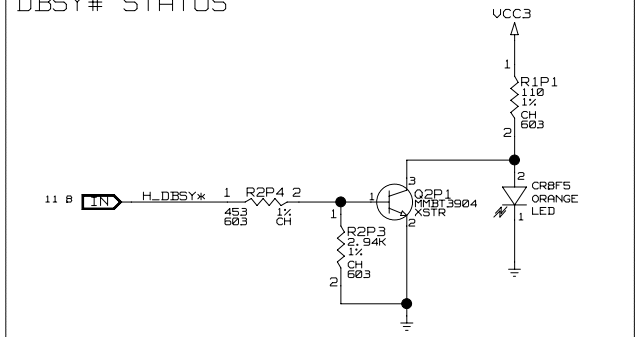
DEBUG HOOKS MOON ISA

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	69	D

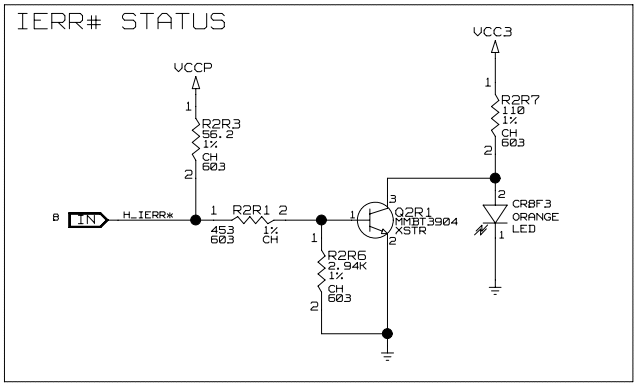
BNR# STATUS



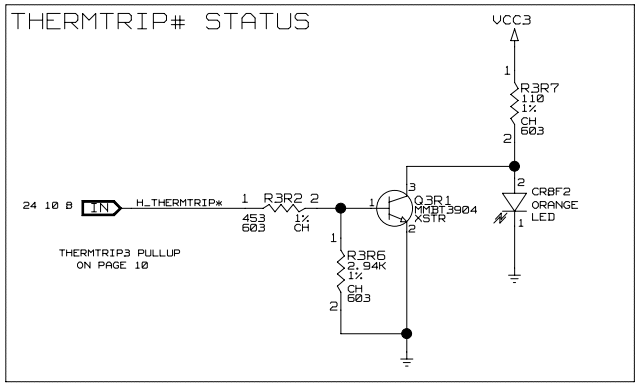
DBSY# STATUS



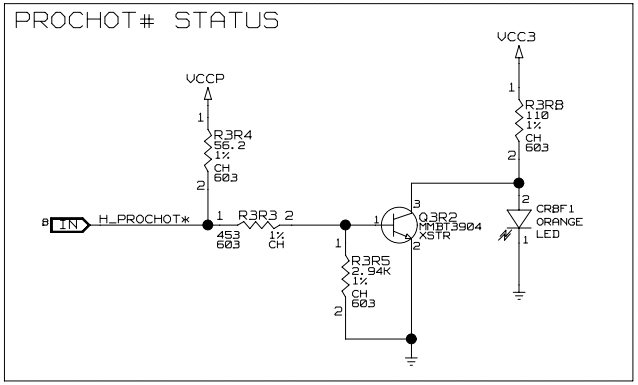
IERR# STATUS



THERMTRIP# STATUS



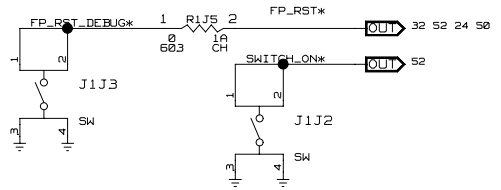
PROCHOT# STATUS

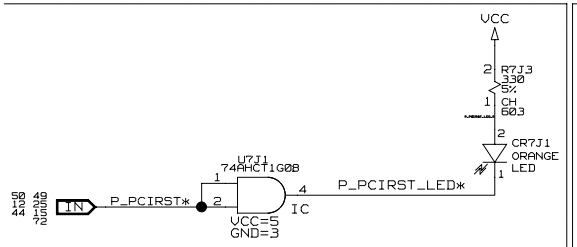


CPU STATUS LEDS

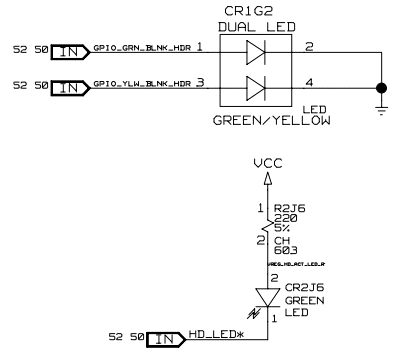
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	70	D

DEBUG/EV FEATURE: FRONT PANEL SWITCHES

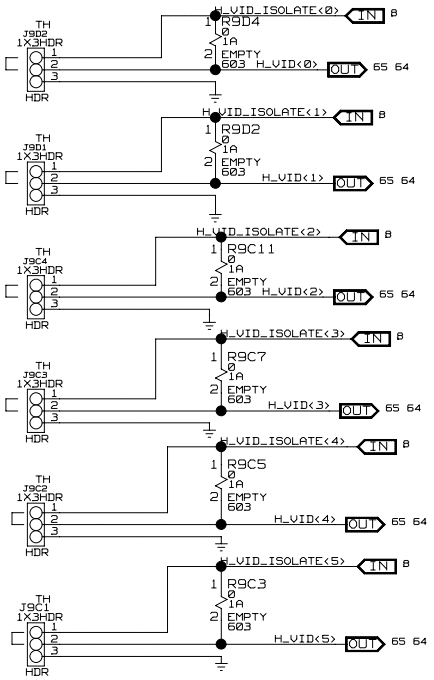




PRODUCT FEATURE: STATUS LED'S

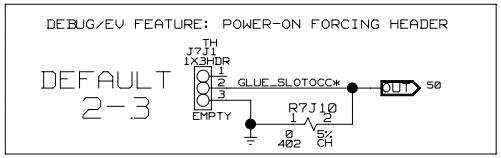


DEBUG/EV FEATURE: VID JUMPERS

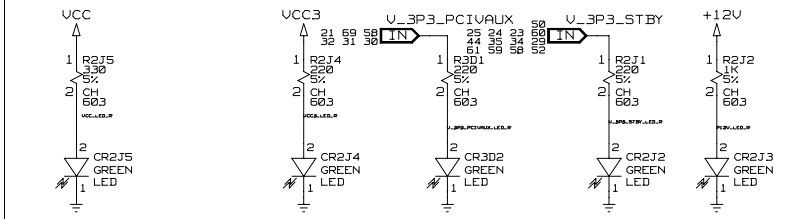


VID 5	4	3	2	1	0	VCORE	VID 5	4	3	2	1	0	VCORE
0	0	0	0	0	0	1.708	1	0	0	0	0	0	1.196
0	0	0	0	0	1	1.692	1	0	0	0	0	1	1.180
0	0	0	0	1	0	1.676	1	0	0	0	1	0	1.164
0	0	0	0	1	1	1.660	1	0	0	0	1	1	1.148
0	0	0	1	0	0	1.644	1	0	0	1	0	0	1.132
0	0	0	1	0	1	1.628	1	0	0	1	0	1	1.116
0	0	0	1	1	0	1.612	1	0	0	1	1	0	1.100
0	0	0	1	1	1	1.596	1	0	0	1	1	1	1.084
0	0	1	0	0	0	1.580	1	0	1	0	0	0	1.068
0	0	1	0	0	1	1.564	1	0	1	0	0	1	1.052
0	0	1	0	1	0	1.548	1	0	1	0	1	0	1.036
0	0	1	0	1	1	1.532	1	0	1	0	1	1	1.020
0	0	1	1	0	0	1.516	1	0	1	1	0	0	1.004
0	0	1	1	0	1	1.500	1	0	1	1	0	1	0.988
0	0	1	1	1	0	1.484	1	0	1	1	1	0	0.972
0	0	1	1	1	1	1.468	1	0	1	1	1	1	0.956
0	1	0	0	0	0	1.452	1	1	0	0	0	0	0.940
0	1	0	0	0	1	1.436	1	1	0	0	0	1	0.924
0	1	0	0	1	0	1.420	1	1	0	0	1	0	0.908
0	1	0	0	1	1	1.404	1	1	0	0	1	1	0.892
0	1	0	1	0	0	1.388	1	1	0	1	0	0	0.876
0	1	0	1	0	1	1.372	1	1	0	1	0	1	0.860
0	1	0	1	1	0	1.356	1	1	0	1	1	0	0.844
0	1	0	1	1	1	1.340	1	1	0	1	1	1	0.828
0	1	1	0	0	0	1.324	1	1	1	0	0	0	0.812
0	1	1	0	0	1	1.308	1	1	1	0	0	1	0.796
0	1	1	0	1	0	1.292	1	1	1	0	1	0	0.780
0	1	1	0	1	1	1.276	1	1	1	0	1	1	0.764
0	1	1	1	0	0	1.260	1	1	1	1	0	0	0.748
0	1	1	1	0	1	1.244	1	1	1	1	0	1	0.732
0	1	1	1	1	0	1.228	1	1	1	1	1	0	0.716
0	1	1	1	1	1	1.212	1	1	1	1	1	1	0.700

DEBUG/EV FEATURE: POWER-ON FORCING HEADER



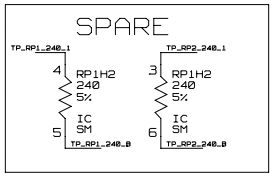
DEBUG/EV FEATURE: POWER RAIL STATUS LED'S



DEBUG STUFFING OPTIONS: BOM=VREG_LED_DEBUG

DEBUG LED DISPLAY

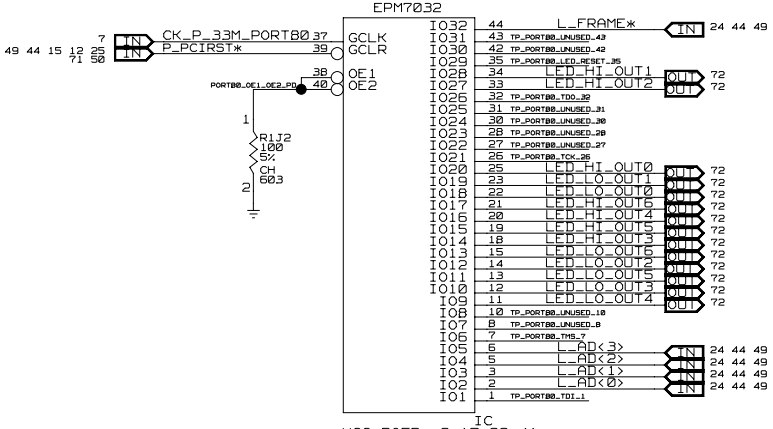
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	71	D



BLANK PART NUMBER: 3.3V COMPATIBLE (IPN XXXXXX-XXX)
PROGRAM FILE FROM D.E. SUBMITTED TO VENDOR
PROGRAM PART NUMBER & PLD-FA: A3B794-001

EPM7032AETC44-10
44 PIN TQFP

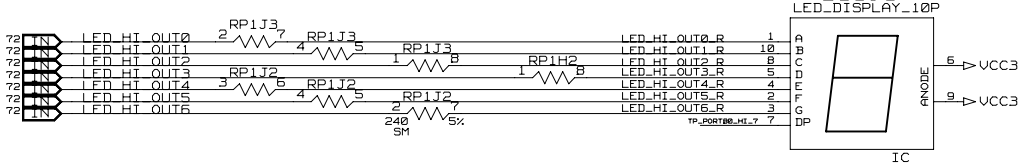
U1J1
EPM7032



VCC(PQFP)=9, 17, 29, 41
GND(PQFP)=4, 16, 24, 36
NC(PQFP)=45
VCC=VCC3(~PORTB0DEC)

CAD NOTE: ORIENT TO LEFT

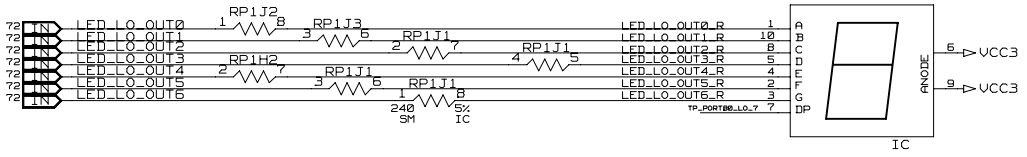
DS1J1
LED_DISPLAY_10P



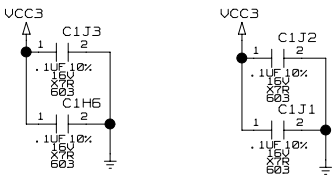
ALL RPACKS 240 OHMS

CAD NOTE: ORIENT TO RIGHT

DS1J2
LED_DISPLAY_10P

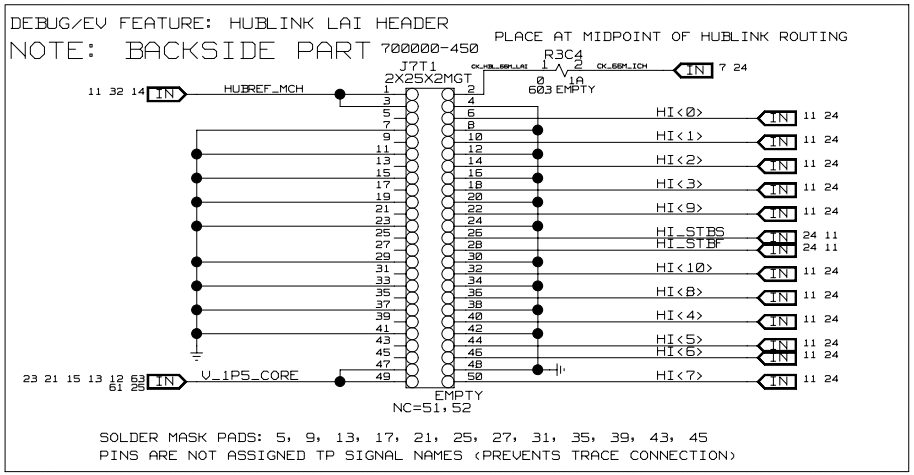


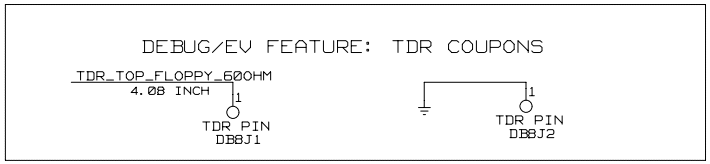
CAD NOTE: PLACE 1 EACH ON PINS 6 & 9 OF EACH DISPLAY

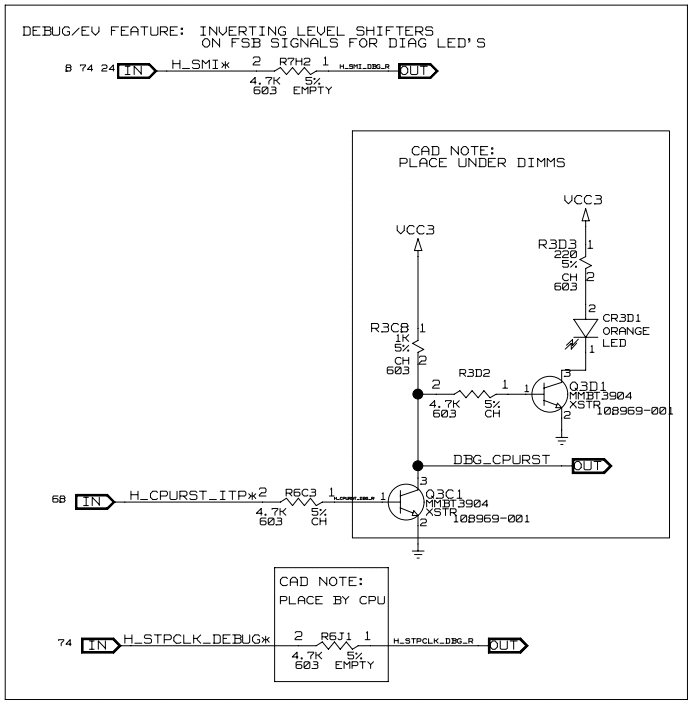


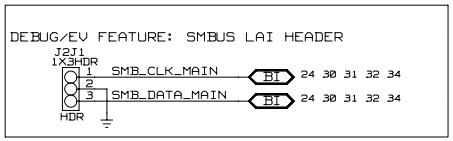
PORT 80

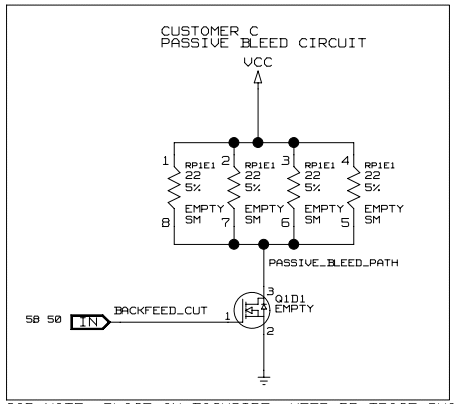
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	72	D







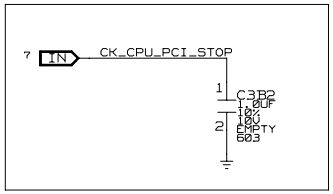


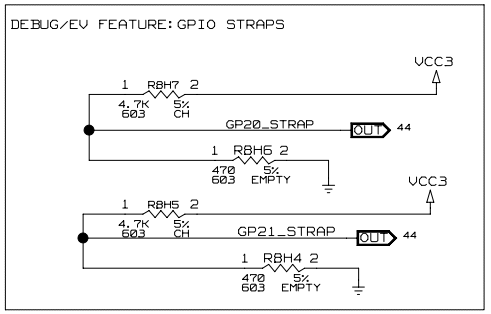


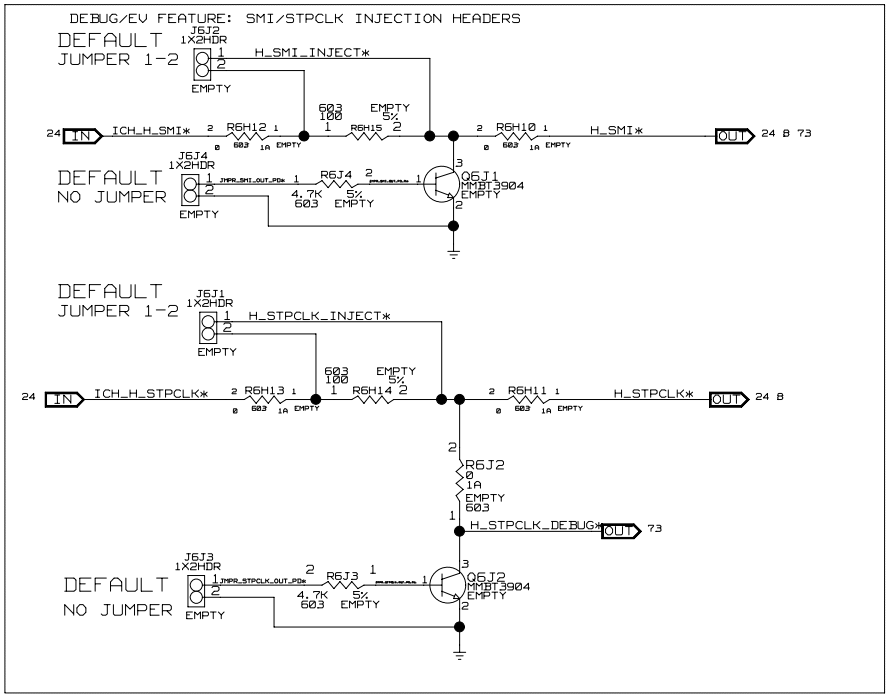
CAD NOTE: PLACE ON BACKSIDE, KEEP DP TRACE SHORT

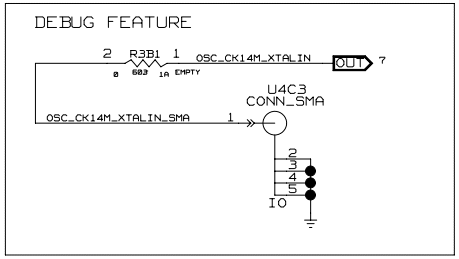
HUBLINK PROBE, TDR COUPONS, LEDS

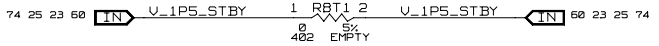
INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	73	D



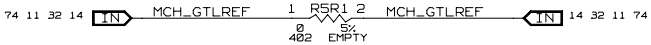








ICH4 E20 BYPASS



DEBUG HEADERS

INTEL CORPORATION 5000 W. CHANDLER BLVD CHANDLER, AZ 85226	DOCUMENT NUMBER	PAGE	REV
	27390302	74	D

REVISION HISTORY

FAB B - REV 1.3

REMOVED UNSUPPORTED SPEED

FAB B - REV 1.4

CHANGED ALL REFERENCES FROM 855GM TO 855GME
PAGE 2 UPDATED BLOCK DIAGRAM TO SHOW AGP 4X ON ADD CONNECTOR
PAGE 7 ADDED INTEL CELERON M PROCESSOR TO CPU BLOCK
PAGE 8 ADDED NOTE TO SHOW V1P2_GMCH NET IS ACTUALLY 1.35 AND 1.2, DEPENDING ON SPEED NEEDED
PAGE 8 REMOVED NS NOTE
PAGE 10 POPULATED PLL CAPS
PAGE 15 UPDATED STRAPPING TABLE

FAB D

PAGE 12 MOVED AGP SUSCLK CIRCUIT TO PAGE 21
PAGE 15 ADDED GMCH STRAPPING TO DRIVE MCH AGP INPUT LOW WHEN AGPDETECT
IS ACTIVATE LOW; WHEN AGP CARD IS PLUGGED IN.
PAGE 21 ADDED SUSCLK CIRCUIT FROM 855GME WITH 6300ESB BELOW AGP CONNECTOR SYMBOL